

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	267188	preamorphization or (preadj2 amorpho\$8)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:47
L2	86423	preamorphization or (preadj2 amorpho\$8) with (silicon or si)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:56
L3	275378	(dop\$6 or implant\$6) with ("B" or boron or "As" or arsenic or "P" or phosphorous)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:51
L4	86870	preamorphization or (preadj2 amorph\$9) with (silicon or si)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:57
L5	10857	l4 same l3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:48
L6	15218	(dop\$6 or implant\$6) with l4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:51
L7	8145	l6 same l3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:50
L8	58347	((si or silicon) near5 (substrate or layer\$12 or film\$1)) with l4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:52
L9	11651	(dop\$6 or implant\$6) with l8	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:51
L10	184912	(dop\$6 or implant\$6) near5 ("B" or boron or "As" or arsenic or "P" or phosphorous)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 15:08

L11	4373	I9 same I10	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:52
L12	35275	((si or silicon) near5 (substrate or layer\$12 or film\$1)) with I10	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:52
L13	3832	I12 same I9	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:53
L14	18970	(dop\$6 or implant\$6) near5 ("Si+" or (silicon near5 ion\$1))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:53
L15	464	I13 same I14	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:54
L16	77995	preamorphization or (preadj2 amorph\$9) near5 (silicon or si)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:55
L17	446	I15 same I16	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:56
L18	199	preamorphization or (pre adj2 amorpho\$8) with (silicon or si)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:57
L19	334	preamorphization or (pre adj2 amorph\$9) with (silicon or si)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:57
L20	86870	preamorphization or (amorph\$9) with (silicon or si)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:57

L21	2688	I14 same I20	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:58
L22	63	I14 same I19	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:58
L23	906	I10 same I21	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 14:58
L24	27	I10 same I22	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 15:07
L25	2688	I14 same I21	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 15:07
L26	570	I12 same I21	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 15:08
L27	570	I12 same I23	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 15:09
L28	5	(grating or waveguid\$6) and I27	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 15:11
L29	290	I19 and I10	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 15:11
L30	112	I19 and I12	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 15:12

L31	76	I14 and I30	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 15:13
L32	2	EP-806794-\$.did.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/01/26 15:14



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FULL ESTIMATED COST	ENTRY	SESSION
	0.21	0.48

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=> s (grating or coupler or DFG)

L1 142298 (GRATING OR COUPLER OR DFG)

=> s crystal?(5a)silicon

L2 0 CRYSTAL?(5A) SILICON

=> s crystal?(5a)silicon

L3 72758 CRYSTAL?(5A) SILICON

=> s amorphous(5a)silicon

L4 63412 AMORPHOUS(5A) SILICON

=> s l1 and l2 and l5

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=> s l1 and l3 and l4

L5 36 L1 AND L3 AND L4

=> d all 1-36

L5 ANSWER 1 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2005:1284944 CAPLUS

ED Entered STN: 08 Dec 2005

TI Room-temperature luminescence from Er-doped SiOx films containing Si nanoparticles

AU Chen, Wei-de; Chen, Chang-yong; Bian, Liu-fang

CS Institute of Semiconductors, Chinese Academy of Sciences, Beijing, 100083, Peop. Rep. China

SO Faguang Xuebao (2005), 26(5), 647-650

CODEN: FAXUEW; ISSN: 1000-7032

PB Kexue Chubanshe

DT Journal

LA Chinese

CC 73 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB Er3+ photoluminescence (PL) in silicon-based materials has been attracting much interest because of its potential application in Si-based optoelectronic devices. Er3+ ions can be doped into different hosts, such as \*\*\*cryst\*\*\*, \*\*\*silicon\*\*\*, hydrogenated \*\*\*amorphous\*\*\*

\*\*\*silicon\*\*\* suboxide (a-SiOx:H), SiO2 film contg. Si nanocrystals and so on. In this report PL properties of undoped and Er3+-doped SiOx films contg. amorphous Si nanoparticles were studied. A-SiOx films contg. Si nanoparticles were prepd. by plasma enhanced chem. vapor deposition (PECVD) using a gas source with mixt. of SiH4 and N2O. Erbium ions were implanted into as-deposited SiOx films at 500 keV with a varying dose range of (1 .apprx. 3) .times. 1015/cm2 and then annealed at 300 .apprx. 900 .degree.C for 30 s under N2. Visible PL expts. were performed with a Dilor XY-800 triple \*\*\*grating\*\*\* spectrometer with a charge-coupled device (CCD) detector. The samples were excited by 514.5 nm line of Ar+ laser. The Er3+ IR PL spectra were measured using FTIR spectrometer (Bruker IFS120HR). The wavelength of Ar+ laser is 514.5 .mu.m and the

nominal laser power was 200 mW. The results showed that the PL intensity from nc-Si in SiO<sub>2</sub> at 750 nm is one order of magnitude stronger than that from \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* clusters in a-SiO<sub>x</sub>:H, and the PL intensity from Er<sup>3+</sup> at 1.54  $\mu$ m in Er doped a-SiO<sub>x</sub>:H is a factor of 4 higher than that in Er doped SiO<sub>2</sub>. The PL and crystallinity of a-SiO<sub>x</sub>:H as function of annealing temp. were also studied. In combination with the Raman measurement, the results show that photoluminescence from amorphous Si nanoparticles also follows the quantum confinement model as in Si-nanocrystals. Our study indicates that a competitive relationship between the light emissions of a-Si clusters and Er<sup>3+</sup> in the Er-doped a-SiO<sub>x</sub>:H film is also present and the films yield efficient Er<sup>3+</sup> emission even superior to that of Er doped SiO<sub>2</sub> contg. Si nanocrystals, suggesting a-Si clusters can also act as both the absorbing medium and sensitizer in Er<sup>3+</sup> excitation as nc-Si in Er doped SiO<sub>2</sub>. Er<sup>3+</sup> emission intensity does not depend strongly upon whether it is nc-Si or a-Si clusters. These results presented here open up a route towards the fabrication of efficient Si-based light-emitting devices.

L5 ANSWER 2 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2005:1022149 CAPLUS  
 ED Entered STN: 22 Sep 2005  
 TI Microstructure of femtosecond laser-induced \*\*\*grating\*\*\* in  
 \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\*  
 AU Lee, Geon Joon; Park, Jisun; Kim, Eun Kyu; Lee, YoungPak; Kim, Kyung Moon;  
 CS Cheong, Hyeonsik; Yoon, Chong Seung; Son, Yong-Duck; Jang, Jin  
 Quantum Photonic Science Research Center and Department of Physics,  
 Hanyang University, Seoul, 133-791, S. Korea  
 SO Optics Express (2005), 13(17), 6445-6453  
 CODEN: OPEXFF; ISSN: 1094-4087  
 URL: [http://www.opticsexpress.org/view\\_file.cfm?doc=%24%29LO%2DK0%20%20%0A&id=%25%28%2C3%2FJ%2C%2C%20%0A](http://www.opticsexpress.org/view_file.cfm?doc=%24%29LO%2DK0%20%20%0A&id=%25%28%2C3%2FJ%2C%2C%20%0A)  
 PB Optical Society of America  
 DT Journal; (online computer file)  
 LA English  
 CC 74 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 AB The femtosecond laser-induced \*\*\*grating\*\*\* (FLIG) formation and  
 \*\*\*crystn\*\*\* were investigated in \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\*  
 (a-Si) films, prepd. on glass by plasma-enhanced chem.-vapor deposition.  
 Probe-beam diffraction, micro-Raman spectroscopy, at. force microscopy,  
 SEM, and transmission electron microscopy were employed to characterize  
 the diffraction properties and the microstructures of FLIGs. It was found  
 that i) the FLIG can be regarded as a pattern of alternating a-Si and  
 microcryst.-silicon ( $\mu$ c-Si) lines with a period of about 2  $\mu$ m, and  
 ii) efficient \*\*\*grating\*\*\* formation and crystn. were achieved by  
 high-intensity recording with a short writing period.

RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L5 ANSWER 3 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2005:999434 CAPLUS  
 DN 144:78810  
 ED Entered STN: 15 Sep 2005  
 TI Two-dimensional patterned nc-Si arrays prepared by the method of laser interference crystallization  
 AU Zou, He-Cheng; Feng, Qiao; Wu, Liang-Cai; Huang, Xin-Fan; Xin, Li; Han, Pei-Gao; Ma, Zhong-Yuan; Li, Wei; Chen, Kun-Ji  
 CS State Key Laboratory of Solid Microstructures, Department of Physics, Nanjing University, Nanjing, 210093, Peop. Rep. China  
 SO Wuli Xuebao (2005), 54(8), 3646-3650  
 CODEN: WLHPAR; ISSN: 1000-3290  
 PB Zhongguo Kexueyuan Wuli Yanjiuso  
 DT Journal  
 LA Chinese  
 CC 76-3 (Electric Phenomena)  
 Section cross-reference(s): 75  
 AB The method of laser-induced crystn. combining with the phase-shifting \*\*\*grating\*\*\* mask (PSGM) was carried out to fabricate nanocryst. silicon (nc-Si) with the two-dimensional (2D) patterned distribution within a-SiNx/a-Si:H/a-SiNx sandwiched structure grown on the SiO2/Si or fused quartz substrate by plasma-enhanced chem. vapor deposition technique. The thicknesses of a-Si:H and a-SiNx layer are 10 and 50 nm, resp. The results of at. force microscopy, cross-section transmission electron microscopy and high resolu. transmission electron microscopy show that the controllable crystd. regions within the initial a-Si:H layer are selectively formed with a diam. of about 250 nm and are patterned with the same 2D periodicity of 2.0 .mu.m as that of the PSGM. Si nanocrystallites, the size of which is almost the same as the thickness of the a-Si:H layer, are formed in the crystd. regions, and have <111> preferred orientation.  
 ST nanocryst \*\*\*silicon\*\*\* laser \*\*\*crystn\*\*\* patterning  
 semiconductor heterostructure nanostructure  
 IT Photomasks (lithographic masks)  
 (phase-shifting \*\*\*gratings\*\*\* ; two-dimensional patterned nc-Si arrays prepd. by laser interference crystn.)  
 IT Vapor deposition process  
 (plasma; two-dimensional patterned nc-Si arrays prepd. by laser interference crystn.)  
 IT Crystal orientation  
 Heterojunction semiconductor devices  
 Interference  
 Laser crystallization  
 Microstructure  
 Nanocrystalline materials  
 Nanostructures  
 (two-dimensional patterned nc-Si arrays prepd. by laser interference crystn.)  
 IT 1333-74-0, Hydrogen, processes  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
 (in \*\*\*amorphous\*\*\* hydrogenated \*\*\*silicon\*\*\* ; two-dimensional patterned nc-Si arrays prepd. by laser interference crystn.)  
 IT 7631-86-9, Silica, processes 60676-86-0, Fused quartz  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)  
 (substrate; two-dimensional patterned nc-Si arrays prepd. by laser interference crystn.)  
 IT 7440-21-3P, Silicon, properties  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PRP (Properties); PYP (Physical process); PREP (Preparation); PROC (Process)  
 (two-dimensional patterned nc-Si arrays prepd. by laser interference crystn.)  
 IT 12033-89-5P, Silicon nitride, properties  
 RL: PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PRP (Properties); PYP (Physical process); PREP (Preparation); PROC (Process)  
 (two-dimensional patterned nc-Si arrays prepd. by laser interference crystn.)

DN 143:184889  
 ED Entered STN: 05 Aug 2005  
 TI Laser annealing apparatus and annealing method of semiconductor thin film using the same  
 IN Hongo, Mikio; Yazaki, Akio; Hatano, Mutsuko  
 PA Japan  
 SO U.S. Pat. Appl. Publ., 21 pp.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM H01L021-00  
 ICS H01S003-13; H01J001-52; H01L021-84; G01J005-02; G21K001-00; H01J003-00; G02B005-00; H01J005-18; H01J029-46  
 INCL 438166000; 250341100; 372029010; 250505100  
 CC 76-3 (Electric Phenomena)  
 Section cross-reference(s): 47, 74, 75

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005170572	A1	20050804	US 2004-986936	20041115
	JP 2005217213	A2	20050811	JP 2004-22461	20040130
PRAI	JP 2004-22461	A	20040130		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 2005170572	ICM	H01L021-00
	ICS	H01S003-13; H01J001-52; H01L021-84; G01J005-02; G21K001-00; H01J003-00; G02B005-00; H01J005-18; H01J029-46
	INCL	438166000; 250341100; 372029010; 250505100
	IPCI	H01L0021-00 [ICM,7]; H01S0003-13 [ICS,7]; H01J0001-52 [ICS,7]; H01L0021-84 [ICS,7]; G01J0005-02 [ICS,7]; G21K0001-00 [ICS,7]; H01J0003-00 [ICS,7]; G02B0005-00 [ICS,7]; H01J0005-18 [ICS,7]; H01J0029-46 [ICS,7]
	NCL	438/166.000
	ECLA	G02B027/09C; G02B027/09E2L2
JP 2005217213	IPCI	H01L0021-268 [ICM,7]; H01L0021-20 [ICS,7]
	FTERM	5F052/AA02; 5F052/BA01; 5F052/BA07; 5F052/BA12; 5F052/BA18; 5F052/BB01; 5F052/BB02; 5F052/BB07; 5F052/DA01; 5F052/DA02; 5F052/JA01

AB A laser beam temporally modulated in amplitude by a modulator and shaped into a long and narrow shape by a beam shaper is rotated around the optical axis of an image rotator inserted between the beam shaper and a substrate. Thus, the longitudinal direction of the laser beam having the long and narrow shape is rotated around the optical axis on the substrate. To perform annealing in a plurality of directions on the substrate, the laser beam shaped into the long and narrow shape is rotated on the substrate while a stage mounted with the substrate is moved only in two directions, i.e., X- and Y-directions. In such a manner, the substrate can be scanned at a high speed with a continuous wave laser beam modulated temporally in amplitude and shaped into a long and narrow shape, without rotating the substrate. Thus, a semiconductor film can be annealed in a large no. of different directions. The annealing app. is reduced in size and wt. and has extended use time. It is also much cheaper than conventional app. This app. is particularly suitable for treating display panels.

ST laser annealing app semiconductor film planar display

IT Semiconductor films

(amorphous; laser annealing app. and annealing method of semiconductor thin film)

IT Laser annealing

Rotation

(app.; laser annealing app. and annealing method of semiconductor thin film)

IT Amorphous semiconductors

(films; laser annealing app. and annealing method of semiconductor thin film)

IT Optical instruments

(kaleidoscope; laser annealing app. and annealing method of semiconductor thin film)

IT Diffraction \*\*\*gratings\*\*\*

Holders

Laser annealing  
 Laser crystallization  
 Lasers  
 Semiconductor films  
 (laser annealing app. and annealing method of semiconductor thin film)

IT Lenses  
 (laser focusing; laser annealing app. and annealing method of semiconductor thin film)

IT 7440-21-3, \*\*\*Silicon\*\*\*, processes  
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
 ( \*\*\*crystn\*\*\* of \*\*\*amorphous\*\*\* for displays; laser annealing app. and annealing method of semiconductor thin film)

L5 ANSWER 5 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2005:378736 CAPLUS  
 DN 143:375999  
 ED Entered STN: 03 May 2005  
 TI Simulation and fabrication of \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* rib-type arrayed waveguide \*\*\*grating\*\*\*  
 AU Liu, Wen-Jen; Cheng, Yen-Hsin; Chen, Steven; Lai, I-Tsen; Lai, Yin-Chieh; Weng, Min-Hang; Shih, Yung-Hui; Lee, Chung-Da  
 CS Department of Material Science and Engineering, I-Shou Univ., Kaohsiung, Taiwan  
 SO Proceedings of SPIE-The International Society for Optical Engineering (2005), 5723(Optical Components and Materials II), 285-296  
 CODEN: PSISDG; ISSN: 0277-786X  
 PB SPIE-The International Society for Optical Engineering  
 DT Journal  
 LA English  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 AB Arrayed waveguide \*\*\*gratings\*\*\* have become key components in modern WDM systems for their multi-functional and multi-application properties. To avoid potential large bending losses and device footprints the technique of high index contrast (HIC) has been developed.  
 \*\*\*Amorphous\*\*\* \*\*\*silicon\*\*\* (a-Si) with HIC feature can be exactly grown by plasma enhanced chem. vapor deposition (PECVD) to achieve reasonable material structure and optical properties. Therefore, a-Si silicon-on-insulator AWG (SOI-AWG) shows excellent promise and can provide key practical devices in DWDM systems for their appropriate characteristics that are inexpensive by mass prodn. similar manufg. processes with VLSI, and easily integrated with other optical electronic ICs. \*\*\*Amorphous\*\*\* \*\*\*silicon\*\*\* SOI-AWG device with 59% extra high refractive index difference (.DELTA.) and the transmission spectrum of AWG's device indicated the insertion loss, crosstalk and side-lobe were lower than -3.5 dB, -25 dB and -45 dB, resp., by 3D beam propagation method were investigated in this study. The smallest chip size of the whole device is smaller than 4.5 cm x 1.2 cm, and the highest coupling loss of the rib waveguide for single mode fiber was about -1.68 dB. Based on the simulation results, the device will be really fabricated by thin-film deposition, photolithog. and dry-etching processes. Optical measurements of \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* films indicated, the refractive index index and the extinction coeff. at 1550 nm wavelength were evidently variable by changing argon/silane (Ar/SiH4) flow rates, RF power and operating vacuum pressure in the range of 300.apprx.500 sccm, wattages of 40.apprx.100 W, and 30.apprx.60 Pa, resp., for 200.degree.C substrate temp. The more refractive index of a-Si films indicated possessing less point defects, dangling bonds, voids, and more hydrogen content and \*\*\*silicon\*\*\* nano- \*\*\*crystd\*\*\* structures. Meanwhile, the more point defects, dangling bonds, \*\*\*silicon\*\*\* nano- \*\*\*crystd\*\*\* structures, and less voids and hydrogen content result in larger extinction coeff. Therefore, we adopted the suitable deposition rate and refractive index at 1550nm wavelength were 0.6 nm/s and 3.5012, resp., to perform real AWG fabrication. From at. force microscopy (AFM) anal. revealed the increased argon/silane flow rate and RF power wattage, and decreased operating vacuum would increase surface roughness. High-resoln. transmission electron microscopy (HRTEM) anal. indicated \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* films mainly had \*\*\*amorphous\*\*\* structure with few \*\*\*silicon\*\*\* nano- \*\*\*crystd\*\*\* structures, point defects and voids might affect the value of the refractive index and

reliability. The structures of the a-Si films all indicated amorphous structure by x-ray diffraction (XRD) anal.

ST \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* rib type arrayed waveguide  
 \*\*\*grating\*\*\* simulation fabrication

IT Vapor deposition process  
 (plasma; simulation and fabrication of \*\*\*amorphous\*\*\*  
 \*\*\*silicon\*\*\* rib type arrayed waveguide \*\*\*grating\*\*\* )

IT Optical properties  
 Photolithography  
 SOI devices  
 Waveguides  
 (simulation and fabrication of \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\*  
 rib type arrayed waveguide \*\*\*grating\*\*\* )

IT 7440-21-3, \*\*\*Silicon\*\*\* , properties  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 ( \*\*\*amorphous\*\*\* ; simulation and fabrication of \*\*\*amorphous\*\*\*  
 \*\*\*silicon\*\*\* rib type arrayed waveguide \*\*\*grating\*\*\* )

RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L5 ANSWER 6 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2005:378721 CAPLUS

DN 143:375995

ED Entered STN: 03 May 2005

TI Simulation and fabrication of silicon oxynitride array waveguide  
 \*\*\*grating\*\*\* for optical communication

AU Liu, Wen-Jen; Lai, Yin-Chieh; Weng, Min-Hang; Chen, Chih-Min; Lee, Peng-Hsiao

CS Department of Material Science and Engineering, I-Shou Univ., Kaohsiung, Taiwan

SO Proceedings of SPIE-The International Society for Optical Engineering (2005), 5723(Optical Components and Materials II), 43-54  
 CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB The transport capacity in optical communication systems has grown tremendously in the past years to satisfy the needs of the rapidly expanding telecommunication market that the transport of data substantially exceeded the multimedia aggregated rate. Arrayed waveguide \*\*\*gratings\*\*\* (called AWG's or PHASAR's) have become key components in modern WEM systems for their multi-functional and multi-application properties. Silicon oxynitride (SiOxNy) grown by plasma enhanced chem. vapor deposition (PECVD) is well-suited for the realized application of high contrast waveguides for the range of the refractive index can be largely tuned (1.45-2.0). SiOxNy AWG device with 3% refractive index difference (.DELTA.) and the transmission spectrum of AWG's device indicated the insertion loss, crosstalk and side-lobe were lower than -3 dB, -15 dB and -40 dB, resp., by 3D beam propagation method were

investigated in this study. The chip size of the whole device is smaller than 4 cm x 1.5 cm, and the highest coupling loss of the rib waveguide for single mode fiber was about -1.6 dB. Based on the simulation results, the device can be really fabricated by thin-film deposition, photo-lithog. and dry-etching processes. Microstructural evolution anal. revealed over-supplied \*\*\*silicon\*\*\* atoms would form \*\*\*silicon\*\*\* nano-\*\*\*crystd\*\*\* structure in the \*\*\*amorphous\*\*\* optical films for lower N2O/(N2+NH3) ratio, and resulted in higher refractive index and extinction coeff. From the SEM (SEM) features of rib-type silicon oxynitride waveguide, we found the profile, and the roughness of side- and top-walls of waveguide reached to the manufg. criteria of AWG device. We had successfully fabricated an AWG device with 8 channels and 1.6nm channel spacing, and the coupling loss and propagation loss were about -2.24 dB and -0.15 dB/cm, resp. While, the AWG device performances need further improvements by modified design, uniform thin film deposition, and accurate dry-etching processes.

ST optical communication silicon oxynitride array waveguide \*\*\*grating\*\*\* simulation fabrication

IT Stress, mechanical

(residual; simulation and fabrication of silicon oxynitride array waveguide \*\*\*grating\*\*\* for optical communication)

IT Absorptivity

Microstructure

Optical communication

Refractive index

Surface roughness

Waveguides

(simulation and fabrication of silicon oxynitride array waveguide \*\*\*grating\*\*\* for optical communication)

IT 11105-01-4, Silicon oxynitride

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(simulation and fabrication of silicon oxynitride array waveguide \*\*\*grating\*\*\* for optical communication)

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L5 ANSWER 7 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2004:230628 CAPLUS

DN 141:45035

ED Entered STN: 22 Mar 2004

TI Two-dimensional patterned nanocrystalline Si array prepared by laser interference crystallization of ultra-thin amorphous Si:H single-layer

AU Huang, Xinfan; Wang, Xiaowei; Qiao, Feng; Zhu, Leyi; Li, Wei; Li, Xuefei; Chen, Kunji; Kang, Lin

CS National Laboratory of Solid State Microstructures and Department of Physics, Nanjing University, Nanjing, 210093, Peop. Rep. China

SO International Journal of Nanoscience (2002), 1(5 & 6), 603-609

CODEN: IJNNAJ; ISSN: 0219-581X

PB World Scientific Publishing Co. Pte. Ltd.

DT Journal

LA English

CC 75-1 (Crystallography and Liquid Crystals)

Section cross-reference(s): 73

AB We employ the method of phase-modulated KrF excimer pulsed laser interference \*\*\*crystn\*\*\* to fabricate nanometer-sized \*\*\*cryst\*\*\* . \*\*\*silicon\*\*\* with two-dimensional patterned distribution within the



ultra-thin amorphous Si:H single-layer. The local phase transition occurs in ultra-thin a-Si:H film after laser interference crystn. under proper energy d. The results of at. force microscopy, Raman scattering spectroscopy, cross-section transmission electron microscopy and SEM demonstrate that Si nanocrystallites are formed within the initial a-Si:H single-layer, selectively located in the distal regions with the diam. of 250 nm and patterned with the same 2D periodicity of 2.0 .mu.m as the phase-shifting \*\*\*grating\*\*\*. The results demonstrate that the present method can be used to fabricate patterned nanocryst. Si films for device applications.

ST two dimensional patterned nanocryst \*\*\*silicon\*\*\* array laser  
interference \*\*\*crystn\*\*\* ; \*\*\*amorphous\*\*\* hydrogenated  
\*\*\*silicon\*\*\* ultrathin film laser interference \*\*\*crystn\*\*\*  
IT Laser radiation  
(pulsed; two-dimensional patterned nanocryst. Si array prepd. by laser  
interference crystn. of ultra-thin amorphous Si:H single-layer)  
IT Laser crystallization  
Nanocrystals  
Surface structure  
Ultrathin films  
(two-dimensional patterned nanocryst. Si array prepd. by laser  
interference crystn. of ultra-thin amorphous Si:H single-layer)  
IT 7440-21-3, Silicon, properties  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP  
(Physical process); PROC (Process)  
(hydrogen-doped; two-dimensional patterned nanocryst. Si array prepd.  
by laser interference crystn. of ultra-thin amorphous Si:H  
single-layer)  
IT 1333-74-0, Hydrogen, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(silicon doped with; two-dimensional patterned nanocryst. Si array  
prepd. by laser interference crystn. of ultra-thin amorphous Si:H  
single-layer)

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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L5 ANSWER 8 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2003:389165 CAPLUS

DN 139:141643

ED Entered STN: 21 May 2003

TI Patterned structures of silicon nanocrystals prepared by pulsed laser  
interference crystallization of ultra-thin a-Si:H single-layer

AU Wang, Xiaowei; Qiao, Feng; Zhu, Leyi; Li, Wei; Li, Jian; Huang, Xinfan;  
Chen, Kunji

CS National Laboratory of Solid State Microstructures and Department of  
Physics, Nanjing University, Nanjing, 210093, Peop. Rep. China

SO Materials Research Society Symposium Proceedings (2003), 737(Quantum  
Confined Semiconductor Nanostructures), 419-424  
CODEN: MRSPDH; ISSN: 0272-9172

PB Materials Research Society

DT Journal

LA English

CC 76-3 (Electric Phenomena)

AB The authors employ the method of phase-modulated KrF excimer pulsed laser  
interference \*\*\*crystn\*\*\* to fabricate nanometer-sized \*\*\*cryst\*\*\*

. \*\*\*silicon\*\*\* (nc-Si) with the two-dimensional (2D) patterned distribution within the ultra-thin a-Si:H single-layer. The local crystn. occurs after interference laser irradsn. under proper energy d. The results of at. force microscopy, Raman scattering spectroscopy, cross-section TEM and SEM demonstrate that Si nano-crystallites are formed within the initial a-Si:H single-layer, selectively located in the discal regions with the diam. of 350 nm and patterned with the same 2-dimensional periodicity of 2.0 .mu.m as the phase-shifting \*\*\*grating\*\*\*. The present method can be used to fabricate patterned nc-Si films for device applications.

ST \*\*\*amorphous\*\*\* hydrogenated \*\*\*silicon\*\*\* ultrathin layer laser interference \*\*\*crystn\*\*\*

IT Atomic force microscopy  
\*\*\*Crystallization\*\*\*  
Laser interferometry  
Nanocrystals  
Raman spectra  
Semiconductor device fabrication  
Semiconductor materials  
Transmission electron microscopy  
(structures of \*\*\*silicon\*\*\* nanocrystals prepd. by pulsed laser interference crystn. of ultra-thin a-Si:H single-layer)

IT 1333-74-0, Hydrogen, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(structures of silicon nanocrystals prepd. by pulsed laser interference crystn. of ultra-thin a-Si:H single-layer)

IT 7440-21-3P, Silicon, uses  
RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(structures of silicon nanocrystals prepd. by pulsed laser interference crystn. of ultra-thin a-Si:H single-layer)

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD

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- (17) Yoffe, A; Advanced in Physics 2001, V50, P1 CAPLUS

L5 ANSWER 9 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2003:191270 CAPLUS

DN 138:393227

ED Entered STN: 11 Mar 2003

TI Patterned distribution of silicon nanocrystals prepared by pulsed laser interference crystallization of an ultrathin a-Si:H single layer

AU Wang, Xiaowei; Qiao, Feng; Zhu, Leyi; Huang, Xinfan; Li, Jian; Li, Wei; Li, Xuefei; Kang, Lin; Chen, Kunji

CS National Laboratory of Solid State Microstructures and Department of Physics, Nanjing University, Nanjing, 210093, Peop. Rep. China

SO Journal of Physics: Condensed Matter (2003), 15(4), 609-615  
CODEN: JCOMEL; ISSN: 0953-8984

PB Institute of Physics Publishing

DT Journal

LA English

CC 75-1 (Crystallography and Liquid Crystals)

AB The authors employ the method of phase-modulated KrF excimer pulsed laser interference crystn. (LIC) to fabricate nanocryst. Si with a two-dimensional (2D) patterned distribution within an ultrathin a-Si:H single layer. A local phase transition occurs in the ultrathin a-Si:H film upon LIC with the appropriate energy d. The results from at. force

microscopy, Raman scattering spectroscopy, planar and cross-sectional TEM and SEM demonstrate that Si nanocrystallites are formed within the initial a-Si:H single layer, selectively located in disk-shaped regions with diams. of 250 nm and patterned with the same 2-dimensional periodicity of 2.0 .mu.m as the phase-shifting \*\*\*grating\*\*\* .

ST patterned distribution \*\*\*silicon\*\*\* nanocrystal laser interference  
\*\*\*crystn\*\*\*

IT Laser \*\*\*crystallization\*\*\*  
Nanocrystals  
(patterned distribution of \*\*\*silicon\*\*\* nanocrystals prepd. by pulsed laser interference \*\*\*crystn\*\*\* . of ultrathin \*\*\*amorphous\*\*\* hydrogenated \*\*\*silicon\*\*\* single layer)

IT 1333-74-0, Hydrogen, properties  
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
(patterned distribution of silicon nanocrystals prepd. by pulsed laser interference \*\*\*crystn\*\*\* . of ultrathin \*\*\*amorphous\*\*\* hydrogenated \*\*\*silicon\*\*\* single layer)

IT 7440-21-3, Silicon, properties  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)  
(patterned distribution of silicon nanocrystals prepd. by pulsed laser interference \*\*\*crystn\*\*\* . of ultrathin \*\*\*amorphous\*\*\* hydrogenated \*\*\*silicon\*\*\* single layer)

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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- (7) Gu, X; J Non-Cryst Solids 1996, V227, P1168
- (8) Heintze, M; Appl Phys Lett 1994, V64, P3148 CAPLUS
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- (10) Huang, X; J Non-Cryst Solids 2000, V266-269, P1015 CAPLUS
- (11) Jiang, M; Chin J Lasers B 1999, V8, P142
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L5 ANSWER 10 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 2003:58498 CAPLUS  
DN 138:116341  
ED Entered STN: 24 Jan 2003  
TI Fabrication of semiconductor devices for dispersing a radiant energy transmission  
IN Chason, Marc; Gamota, Daniel; Lempkowski, Robert  
PA Motorola, Inc., USA  
SO U.S. Pat. Appl. Publ., 36 pp.  
CODEN: USXXCO  
DT Patent  
LA English  
IC ICM H01L033-00  
INCL 257103000  
CC 76-3 (Electric Phenomena)  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	US 2003015722	A1	20030123	US 2001-905935	20010717
PRAI	US 2001-905935		20010717		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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US 2003015722	ICM	H01L033-00
	INCL	257103000
	IPCI	H01L0033-00 [ICM,7]
	NCL	257/103.000
	ECLA	H01L021/822B; H01L027/15; H01L021/8258; H01L027/06C; H01L027/06E

AB The invention relates to the fabrication of semiconductor devices for dispersing a radiant energy transmission. High quality epitaxial layers of monocryst. materials can be grown overlying monocryst. substrates such as large silicon wafers by forming a compliant substrate for growing the monocryst. layers. An accommodating buffer layer consists of a layer of monocryst. oxide spaced apart from a \*\*\*silicon\*\*\* wafer by an \*\*\*amorphous\*\*\* interface layer of \*\*\*silicon\*\*\* oxide. The amorphous interface layer dissipates strain and permits the growth of a high quality monocryst. oxide accommodating buffer layer. The accommodating buffer layer is lattice matched to both the underlying silicon wafer and the overlying monocryst. material layer. Any lattice mismatch between the accommodating buffer layer and the underlying silicon substrate is taken care of by the amorphous interface layer. In addn., formation of a compliant substrate may include utilizing surfactant-enhanced epitaxy, epitaxial growth of single \*\*\*crystal\*\*\* \*\*\*silicon\*\*\* onto single \*\*\*crystal\*\*\* oxide, and epitaxial growth of Zintl phase materials.

ST semiconductor device dispersal radiant energy transmission

IT Semiconductor materials  
(Group IIIA element pnictide, diffraction component material; fabrication of semiconductor devices for dispersing a radiant energy transmission)

IT Oxides (inorganic), uses  
RL: DEV (Device component use); USES (Uses)  
(amorphous, perovskite; fabrication of semiconductor devices for dispersing a radiant energy transmission)

IT Etching  
Melting  
(diffraction component formed by; fabrication of semiconductor devices for dispersing a radiant energy transmission)

IT Metals, uses  
Polycarbonates, uses  
Polymers, uses  
RL: DEV (Device component use); USES (Uses)  
(diffraction component material; fabrication of semiconductor devices for dispersing a radiant energy transmission)

IT Diffraction \*\*\*gratings\*\*\*  
Diffractometers  
Epitaxy  
Light sources  
Optical detectors  
Semiconductor devices  
(fabrication of semiconductor devices for dispersing a radiant energy transmission)

IT Electromagnetic wave  
(transmission; fabrication of semiconductor devices for dispersing a radiant energy transmission)

IT 1303-00-0, Gallium arsenide, uses 9003-53-6 22398-80-7, Indium phosphide, uses 37382-15-3, Aluminum gallium arsenide (AlGaAs) 106312-00-9, Gallium indium phosphide (GaInP)  
RL: DEV (Device component use); USES (Uses)  
(diffraction component material; fabrication of semiconductor devices for dispersing a radiant energy transmission)

IT 7440-21-3, Silicon, uses  
RL: DEV (Device component use); USES (Uses)  
(substrate; fabrication of semiconductor devices for dispersing a radiant energy transmission)

L5 ANSWER 11 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2001:602433 CAPLUS

DN 136:12425

ED Entered STN: 21 Aug 2001

TI Reversible Recording of Interference \*\*\*Gratings\*\*\* with a Diffraction Efficiency above 50% in an \*\*\*Amorphous\*\*\* Hydrogenized \*\*\*Silicon\*\*\* -Nematic Liquid \*\*\*Crystal\*\*\* Structure

AU Ivanova, N. L.; Onokhov, A. P.; Chaika, A. N.

CS Vavilov Optical Institute, State Scientific Center of the Russian Federation, St. Petersburg, 190164, Russia

SO Technical Physics Letters (Translation of Pis'ma v Zhurnal Tekhnicheskoi Fiziki) (2001), 27(8), 647-648  
CODEN: TPLEED; ISSN: 1063-7850

PB MAIK Nauka/Interperiodica Publishing

DT Journal  
 LA English  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 74, 75  
 AB The properties of a space-time light modulator comprising an a-Si:H based p-i-n diode and a nematic liq. crystal layer were studied using a holog. technique. Under certain conditions, an asymmetry of the diffraction efficiency in the +1 and -1 diffraction orders was obsd. The max. diffraction efficiency in 1 of these orders may reach .ltoreq.52%, which is a record value for devices of this type.  
 ST interference \*\*\*grating\*\*\* recording \*\*\*amorphous\*\*\* hydrogenated  
 \*\*\*silicon\*\*\* nematic liq \*\*\*crystal\*\*\*  
 IT Optical diffraction  
 (efficiency of interference \*\*\*gratings\*\*\* in \*\*\*amorphous\*\*\*  
 hydrogenated \*\*\*silicon\*\*\* -nematic liq. \*\*\*crystal\*\*\*  
 structure)  
 IT Diffraction \*\*\*gratings\*\*\*  
 (interference; reversible recording in \*\*\*amorphous\*\*\* hydrogenated  
 \*\*\*silicon\*\*\* structure with)  
 IT Liquid crystals  
 (nematic; reversible recording of interference \*\*\*gratings\*\*\* in  
 \*\*\*amorphous\*\*\* hydrogenated \*\*\*silicon\*\*\* structure with)  
 IT Optical modulators  
 (optically addressable space-time; reversible recording of interference  
 \*\*\*gratings\*\*\* in \*\*\*amorphous\*\*\* hydrogenated \*\*\*silicon\*\*\*  
 -nematic liq. \*\*\*crystal\*\*\* structure)  
 IT Holography  
 (reversible recording of interference \*\*\*gratings\*\*\* in  
 \*\*\*amorphous\*\*\* hydrogenated \*\*\*silicon\*\*\* -nematic liq.  
 \*\*\*crystal\*\*\* structure)  
 IT Recording  
 (reversible; of interference \*\*\*gratings\*\*\* in \*\*\*amorphous\*\*\*  
 hydrogenated \*\*\*silicon\*\*\* -nematic liq. \*\*\*crystal\*\*\*  
 structure)  
 IT 1333-74-0, Hydrogen, uses  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES  
 (Uses)  
 (reversible recording of interference \*\*\*gratings\*\*\* in nematic  
 liq. \*\*\*crystal\*\*\* structure with \*\*\*amorphous\*\*\*  
 \*\*\*silicon\*\*\* contg.)  
 IT 7440-21-3, Silicon, uses  
 RL: DEV (Device component use); USES (Uses)  
 (reversible recording of interference \*\*\*gratings\*\*\* in nematic  
 liq. crystal structure with hydrogenated amorphous)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD

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 (8) Mukohraka, N; Appl Opt 1994, V33(14), P2804  
 (9) Vasil'ev, A; Spatial Light Modulators 1987

L5 ANSWER 12 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1999:189714 CAPLUS

DN 130:318714

ED Entered STN: 23 Mar 1999

TI Formation of the patterned nanocrystalline Si by pulsed laser interference crystallization of a-Si:H thin films

AU Wang, Mingxiang; Chen, Kunji; Jiang, Ming; Liu, Xiaoyong; Wu, Zhuangchun; Li, Wei; Wang, Mu; Huang, Xinfan

CS State Key Laboratory of Solid State Microstructures and Department of, Nanjing University, Nanjing, 210093, Peop. Rep. China

SO Proceedings of SPIE-The International Society for Optical Engineering (1998), 3550(Laser Processing of Materials and Industrial Applications II), 80-84

CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal  
 LA English  
 CC 75-1 (Crystallography and Liquid Crystals)  
 Section cross-reference(s): 73, 76  
 AB A new method of prepg. patterned nanocryst. Si (nc-Si) by pulsed laser interference crystn. of a-Si:H thin films is reported. A KrF excimer pulsed laser with wavelength 248 nm and pulse duration 30 ns is employed as a coherent UV beam source; a 1-/2-dimensional (1D/2D) SiO2 phase-shifting \*\*\*grating\*\*\* was used to form a high-contrast laser interference pattern behind it. During the laser treatment, the a-Si:H film is placed behind near contact with the phase \*\*\*grating\*\*\*. A transient thermal 1D/2D grid is then directly formed on the sample, leading to the local crystn. of the a-Si:H films and forming of nanocryst. Si. The crystallinity of nc-Si films is verified by Raman scattering. At. force microscopy clearly shows a morphol. of 1D/2D regular submicron patterns formed by locally crystd. stripes/dots, which are composed of densely gathered crystallites with a lateral size of .apprx.50-100 nm and a height of .apprx.10-20 nm. The interfaces between the crystd. and the amorphous zones are abrupt. TEM demonstrates a lateral size distribution of nc-Si within the crystd. zones. This new approach has a potential application in the nanoelectronics and nano-optoelectronics.  
 ST laser interference \*\*\*crystn\*\*\* \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\*  
 IT patterned nanocryst formation  
 Laser \*\*\*crystallization\*\*\*  
 Nanocrystals  
 (formation of patterned nanocryst. \*\*\*silicon\*\*\* by pulsed laser interference \*\*\*crystn\*\*\* . of \*\*\*amorphous\*\*\* hydrogenated \*\*\*silicon\*\*\* thin films)  
 IT Optical instruments  
 (phase shifters; formation of patterned nanocryst. \*\*\*silicon\*\*\* by pulsed laser interference \*\*\*crystn\*\*\* . of \*\*\*amorphous\*\*\* hydrogenated \*\*\*silicon\*\*\* thin films using silica phase shift \*\*\*grating\*\*\* )  
 IT 1333-74-0, Hydrogen, processes  
 RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
 (formation of patterned nanocryst. \*\*\*silicon\*\*\* by pulsed laser interference \*\*\*crystn\*\*\* . of \*\*\*amorphous\*\*\* hydrogenated \*\*\*silicon\*\*\* thin films)  
 IT 7440-21-3, Silicon, processes  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (formation of patterned nanocryst. \*\*\*silicon\*\*\* by pulsed laser interference \*\*\*crystn\*\*\* . of \*\*\*amorphous\*\*\* hydrogenated \*\*\*silicon\*\*\* thin films)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (2) Chen, K; Appl Phys Lett 1992, V61, P2069 CAPLUS
- (3) Edelberg, E; Appl Phys Lett 1996, V68, P1415 CAPLUS
- (4) Hill, K; Appl Phys Lett 1993, V62, P1035 CAPLUS
- (5) Kunji, C; J Non-cryst Solids 1998, V227-230, P934
- (6) Ming, J; submitted to J Chinese Laser
- (7) Nebel, C; Mat Res Soc Symp Proc 1996, V420, P117 CAPLUS
- (8) Ruckschloss, M; Appl Phys Lett 1993, V63, P1474
- (9) Wang, M; Appl Phys Lett 1998, V72, P722 CAPLUS
- (10) Wang, M; to be published in Appl Phys Lett 1998, V73 CAPLUS

L5 ANSWER 13 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1997:427805 CAPLUS

DN 127:128459

ED Entered STN: 10 Jul 1997

TI Resolution and response-time dependence of ferroelectric liquid-crystal optically addressed spatial light modulators on \*\*\*grating\*\*\* profiles

AU Perennes, F.; Wu, Z. Y.

CS Department d'Optique, Unite Mixte de Recherche, Centre Nationale de la Recherche 1329, Ecole Nationale Supérieure des Telecommunications de Bretagne, Brest, 29285, Fr.

SO Applied Optics (1997), 36(17), 3825-3834

CODEN: APOPAI; ISSN: 0003-6935

PB Optical Society of America

DT Journal

LA English

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
Section cross-reference(s): 75, 76

AB We introduce a model to analyze the time response of an optically addressed spatial light modulator (OASLM) when a two-dimensional image is written on it. Comparison with exptl. results was performed using \*\*\*gratings\*\*\* as input images. For a given spatial frequency, we show that the response time of the device depends on the \*\*\*grating\*\*\* profile. The effect of the time-const. mechanism is demonstrated theor. and exptl. for a sinusoidal-wave and a square-wave intensity profile. An alternative explanation for the resohn. limitation of the OASLM that is related to the time-const. mechanism and a new method for measuring the resohn. of the device are proposed.

ST ferroelec liq crystal spatial light modulator; optically addressed ferroelec SLM \*\*\*grating\*\*\*

IT Liquid crystals  
(ferroelec.; resohn. and response time of \*\*\*grating\*\*\* profiles in optically addressed ferroelec. liq. crystal spatial light modulators)

IT Ferroelectric materials  
(liq.-crystal; resohn. and response time of \*\*\*grating\*\*\* profiles in optically addressed ferroelec. liq. crystal spatial light modulators)

IT Electrooptical switches  
Laser induced \*\*\*grating\*\*\*  
Simulation and Modeling, physicochemical  
Spatial light modulators  
(resohn. and response time of \*\*\*grating\*\*\* profiles in optically addressed ferroelec. liq. crystal spatial light modulators)

IT 12385-13-6, Hydrogen atom, uses  
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
(doped \*\*\*silicon\*\*\* in photoaddressed ferroelec. liq. \*\*\*crystal\*\*\* spatial light modulator)

IT 7440-21-3, \*\*\*Silicon\*\*\*, uses  
RL: DEV (Device component use); USES (Uses)  
(photoaddressed ferroelec. liq. \*\*\*crystal\*\*\* spatial light modulator using \*\*\*amorphous\*\*\* hydrogenated \*\*\*silicon\*\*\* layer)

IT 133758-42-6, SCE 13  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(resohn. and response time of \*\*\*grating\*\*\* profiles in optically addressed ferroelec. liq. crystal spatial light modulators)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (2) Barbier, P; Appl Opt 1992, V31, P3898 CAPLUS
- (3) Barbier, P; Opt Eng 1994, V33, P1322 CAPLUS
- (4) Fukushima, S; Jpn J Appl Phys 1994, V33, P5747 CAPLUS
- (5) Hudson, T; Appl Opt 1991, V30, P2867 CAPLUS
- (6) Li, W; IEEE Trans Electron Devices 1989, V30, P2959
- (7) Pellat-Finet, P; Optik 1995, V100, P159
- (8) Perennes, F; Ferroelectrics 1996, V181, P129 CAPLUS
- (9) Roach, W; IEEE Trans Electron Devices 1974, VED-21, P453
- (10) Wang, L; J Appl Phys 1995, V78, P6923 CAPLUS
- (11) Wang, L; Opt Lett 1994, V19, P2033
- (12) Williams, D; J Phys D 1988, V20, P5156

L5 ANSWER 14 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1995:808848 CAPLUS

DN 123:350793

ED Entered STN: 23 Sep 1995

TI Experimental and theoretical studies of hydrogenated amorphous semiconductor alloys and superlattices

AU Weisz, Z. S.; Gomez, M.

CS Puerto Rico Univ., Rio Piedras, P. R.

SO Report (1994), ARO-25715.6-MS-SAH; Order No. AD-A276159, 132 pp. Avail.: NTIS

From: Gov. Rep. Announce. Index (U. S.) 1994, 94(12), Abstr. No. 435,212

DT Report

LA English

CC 65-6 (General Physical Chemistry)  
Section cross-reference(s): 66

AB We developed the photocarrier \*\*\*grating\*\*\* technique for carrier mobility-lifetime products (micro-Tau) measurements. Applying this technique to hydrogenated \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* (a-Si:H), we obtained micro-Tau values ranging from 10(exp-8) to 10(exp-5) sq. cm/V for the majority and 10(exp-10)-10(exp-8) for the minority carrier. This served as a basis for quality evaluation of prep'd. by different methods. We established that the dominant recombination mechanism is the defect pool mechanism. Using the semiconductor-electrolyte system, we studied the d. of localized states in a-Si-H and compared it to \*\*\*cryst\*\*\*. \*\*\*silicon\*\*\*. We found in a-Si:H an overall d. of localized states in 10(exp-18)/cu cm. In cryst. Si only surface states were found, of an overall d. of 10(exp-12) cm. The sq cm states are centered around 0.2 eV the conduction band edge. The transport properties of two other disordered systems that may be relevant to a-Si-H were studied theor. These systems consists of metal cermet and of small colloidal suspensions.

ST hydrogenated amorphous semiconductor alloy superlattice

IT Colloids  
Electric current carriers  
Electrolytes  
Semiconductor materials, amorphous  
Surface  
Suspensions  
Transport process and property  
(exptl. and theor. studies of hydrogenated amorphous semiconductor alloys and superlattices)

IT Order  
(disorder, exptl. and theor. studies of hydrogenated amorphous semiconductor alloys and superlattices)

IT 1333-74-0, Hydrogen, properties  
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
(exptl. and theor. studies of hydrogenated amorphous semiconductor alloys and superlattices)

IT 7440-21-3, Silicon, properties  
RL: PRP (Properties)  
(exptl. and theor. studies of hydrogenated amorphous semiconductor alloys and superlattices)

L5 ANSWER 15 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1993:586292 CAPLUS

DN 119:186292

ED Entered STN: 30 Oct 1993

TI Low-symmetry metastable phases formed during \*\*\*crystallization\*\*\* of the metallic glass palladium- \*\*\*silicon\*\*\* (Pd80Si20)

AU Li, Zongquan; Qin, Yong; He, Yizhen

CS Inst. Solid State Phys., Acad. Sin., Hefei, Peop. Rep. China

SO Physica Status Solidi A: Applied Research (1993), 138(1), 47-57  
CODEN: PSSABA; ISSN: 0031-8965

DT Journal

LA English

CC 56-8 (Nonferrous Metals and Alloys)

AB Low-symmetry metastable phases with planar defects of the metallic glass Pd80Si20 are obsd. at the initial stage of crystn. Since the reciprocal points are stretched into rods in the direction perpendicular to the planar defects, when the reciprocal rods intersect the Ewald sphere, electron diffraction patterns with cross- \*\*\*grating\*\*\* bands will be obtained. Geometrically the indexes of these diffraction spots can be directly obtained from these diffraction patterns. The structure parameters of these low-symmetry phases are analyzed with the aid of high-order Laue zones and Laue spots. The appearance of these metastable phases reveals that the crystn. of the metallic glass Pd80Si20 is a complicated and compn.-dependent process, and the lattice parameters of these metastable phases are affected by the local compn.

ST palladium \*\*\*silicon\*\*\* glass metastable \*\*\*crystn\*\*\*

IT \*\*\*Crystallization\*\*\*  
(of palladium- \*\*\*silicon\*\*\* \*\*\*amorphous\*\*\* alloy, low-symmetry metastable phase formation in)

IT Metallic glasses  
RL: PRP (Properties)  
(palladium alloy, crystn. of, low-symmetry metastable phase formation in)

IT 12778-98-2, Palladium 80, \*\*\*silicon\*\*\* 20 (atomic)



RL: PRP (Properties)  
( \*\*\*crystn\*\*\* . of \*\*\*amorphous\*\*\* , low-symmetry metastable  
phase formation in)

L5 ANSWER 16 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1987:627504 CAPLUS  
DN 107:227504  
ED Entered STN: 12 Dec 1987  
TI Substrate for semiconductor devices and its fabrication method  
IN Setsune, Kentaro; Miyauchi, Michihiro; Hirao, Takashi  
PA Matsushita Electric Industrial Co., Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 3 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
IC ICM H01L021-20  
ICS H01L021-263; H01L027-00  
CC 76-3 (Electric Phenomena)  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 62203325	A2	19870908	JP 1986-46541	19860304
PRAI	JP 1986-46541		19860304		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 62203325	ICM	H01L021-20
	ICS	H01L021-263; H01L027-00
	IPCI	H01L0021-20 [ICM,4]; H01L0021-263 [ICS,4]; H01L0027-00 [ICS,4]

AB Claimed is a substrate for a semiconductor device comprising an amorphous base (e.g., quartz) and an amorphous or polycryst. Si film, where part of the film edge is periodically removed to form a \*\*\*grating\*\*\*. Also, claimed is a fabrication method thereof comprising the steps of: prepg. a Si film on a part of the amorphous film; prepg. the \*\*\*grating\*\*\* region by periodically removing a part of the Si film; prepg. a capping film on the Si film; and regionally heating the substrate and moving a heated region to crystallize the Si film. The method can prep. high-quality single-crystal Si films, and thus permit the use of amorphous substrate materials.

ST semiconductor device amorphous substrate base; \*\*\*silicon\*\*\*  
\*\*\*crystn\*\*\* semiconductor device substrate

IT Semiconductor devices  
(amorphous substrate bases for, \*\*\*crystn\*\*\* . of \*\*\*amorphous\*\*\*  
\*\*\*silicon\*\*\* for)

IT Ceramic materials and wares  
(amorphous, for fabrication of transistors)

IT Heating  
(in \*\*\*crystn\*\*\* . of \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* for  
semiconductor device substrates)

IT Glass, oxide  
RL: USES (Uses)  
(semiconductor device substrates from)

IT 14808-60-7, Quartz, uses and miscellaneous  
RL: USES (Uses)

(semiconductor device substrates from covering of, with single-  
\*\*\*crystal\*\*\* \*\*\*silicon\*\*\* )

IT 7440-21-3, \*\*\*Silicon\*\*\* , uses and miscellaneous

RL: DEV (Device component use); TEM (Technical or engineered material  
use); USES (Uses)

(single- \*\*\*crystal\*\*\* , \*\*\*amorphous\*\*\* substrates covered with,  
for semiconductor devices)

L5 ANSWER 17 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1986:543307 CAPLUS  
DN 105:143307  
ED Entered STN: 18 Oct 1986  
TI \*\*\*Amorphous\*\*\* \*\*\*silicon\*\*\* spatial light modulator  
IN Ashley, Paul R.  
PA USA  
SO U. S. Pat. Appl., 8 pp. Avail. NTIS Order No. PAT-APPL-6-812 603.  
CODEN: XAXXAV

DT Patent  
LA English  
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 812603	A0	19860523	US 1985-812603	19851223
PRAI	US 1985-812603		19851223		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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AB	An amorphous Si spatial light modulator is described that includes a unique 3-electrode structure used to create a 2-dimensional elec. field distribution in liq. crystal material. This modulator allows for the use of very thin photoconductor layers and a middle electrode in the form of a ***grating*** structure to provide control of the field shape while also providing for high spatial resoln.		
ST	light modulator	***amorphous***	***silicon*** thin
IT	Optical imaging devices (electro-, liq.- ***crystal*** , ***amorphous*** ***silicon*** spatial light modulator for)		
IT	Optical instruments (modulators, with ***amorphous*** ***silicon*** , contg. 3-electrode structure)		
IT	7440-21-3, uses and miscellaneous RL: USES (Uses) (amorphous, spatial light modulator from, with 3-electrode structure)		

L5 ANSWER 18 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1986:542324 CAPLUS

DN 105:142324

ED Entered STN: 18 Oct 1986

TI The diffraction of light by transient \*\*\*gratings\*\*\* in \*\*\*crystalline\*\*\* , ion-implanted, and \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\*

AU Vaitkus, J.; Jarasiunas, K.; Gaubas, E.; Jonikas, L.; Pranaitis, R.; Subacius, L.

CS Dep. Semicond. Phys., Vilnius V. Kapsukas State Univ., Vilnius, 232054, USSR

SO IEEE Journal of Quantum Electronics (1986), QE-22(8), 1298-1305  
CODEN: IEJQA7; ISSN: 0018-9197

DT Journal

LA English

CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB The results of the transient \*\*\*grating\*\*\* technique applied to single crystals of Si were analyzed by taking into account free carrier absorption and nonlinear recombination. By using different configurations of this technique, the exposure and decay characteristics of \*\*\*gratings\*\*\* in the vol. or surface of Si of different properties (pure, doped with deep or shallow traps, ion implanted, or amorphous) were investigated. The presence of impurities does not change the dominant mechanism of n modulation by the photogenerated nonequil. carriers. Increased damage of Si leads to a decrease in carrier diffusion (implanted Si) with, in the case of amorphous Si, domination of \*\*\*grating\*\*\* decay by carrier recombination. The properties of \*\*\*gratings\*\*\* in high external d.c. or a.c. (microwave) elec. fields enables one to evaluate hot carrier diffusion coeffs.

ST optical diffraction transient \*\*\*grating\*\*\* silicon

IT Optical diffraction (by transient \*\*\*gratings\*\*\* in \*\*\*cryst\*\*\* . and ion implanted or \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* )

IT Electric current carriers (diffusion coeffs. of, in silicon)

IT Diffraction \*\*\*gratings\*\*\* (transient, in \*\*\*cryst\*\*\* . and ion implanted and \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* )

IT 7440-21-3, properties

RL: PRP (Properties)

(optical diffraction by transient \*\*\*gratings\*\*\* in cryst. or ion implanted or hydrogenated amorphous)

IT 7440-42-8, properties 7440-57-5, properties 7723-14-0, properties  
12385-13-6, properties  
RL: PRP (Properties)  
(optical diffraction by transient \*\*\*gratings\*\*\* in silicon contg.)

L5 ANSWER 19 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1985:531845 CAPLUS

DN 103:131845

ED Entered STN: 19 Oct 1985

TI Laser-induced optical diffraction in \*\*\*crystalline\*\*\* and  
\*\*\*amorphous\*\*\* \*\*\*silicon\*\*\*

AU Vaitkus, J.; Jarasiunas, K.; Gaubas, E.; Tinfavicius, E.; Kulevicius, C.;  
Miskinis, J.

CS Vilnius. Gos. Univ., Vilnius, USSR

SO Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya (1985), 49(6), 1173-8

CODEN: IANFAY; ISSN: 0367-6765

DT Journal

LA Russian

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related  
Properties)

Section cross-reference(s): 76

AB Self-diffraction of light on laser-induced optical \*\*\*gratings\*\*\* was  
studied exptl. in pure and B-doped (1015 - 2 .times. 1019 cm-3 concn.)  
single-cryst. Si, and the results are discussed in terms of dynamics of  
nonequil. charge carriers and of dependence of the light-induced change of  
n on dopant concn. By increasing the dopant concn., substantial  
rearrangement of the energy spectrum occurs, leading to satn. of the  
effect. Self-diffraction with the effectiveness of 0.05-0.15% was obsd.  
also in amorphous films of .alpha.-Si:H, .alpha.-Si:H(Al), and  
.alpha.-Si:H(Ni,Cr) excited by 10-ns laser pulses at .lambda. = 0.53  
.mu.m. The effect was obsd. over the energy d. range 20-40 mJ.

ST laser radiation self diffraction silicon; \*\*\*grating\*\*\* optical  
silicon laser diffraction

IT Laser radiation, chemical and physical effects

(dynamic diffraction \*\*\*gratings\*\*\* induced by, in pure and  
boron-doped \*\*\*cryst\*\*\* . and \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* )

IT Diffraction \*\*\*gratings\*\*\*

(laser-induced, in pure and boron-doped \*\*\*cryst\*\*\* . and  
\*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* )

IT Optical nonlinear property

(self-diffraction, in pure and boron-doped \*\*\*cryst\*\*\* . and  
\*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* )

IT Electric current carriers

(nonequil., in pure and boron-doped \*\*\*cryst\*\*\* . and  
\*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* , self-diffraction of laser  
radiation in relation to)

IT Optical diffraction

(self-, of laser radiation in pure and boron-doped \*\*\*cryst\*\*\* . and  
\*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* )

IT 7440-21-3, properties

RL: PRP (Properties)

(laser-induced optical diffraction in pure and boron-doped)

IT 1333-74-0, properties

RL: PRP (Properties)

(self-diffraction of laser radiation in \*\*\*amorphous\*\*\*  
\*\*\*silicon\*\*\* contg.)

IT 7429-90-5, properties 7440-02-0, properties 7440-47-3, properties

RL: PRP (Properties)

(self-diffraction of laser radiation in hydrogenated \*\*\*amorphous\*\*\*  
\*\*\*silicon\*\*\* contg.)

IT 7440-42-8, properties

RL: PRP (Properties)

(self-diffraction of laser radiation in silicon contg.)

L5 ANSWER 20 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1983:82125 CAPLUS

DN 98:82125

ED Entered STN: 12 May 1984

TI Flash-lamp-induced \*\*\*crystal\*\*\* growth of \*\*\*silicon\*\*\* on

\*\*\*amorphous\*\*\* substrates using artificial surface-relief structures

AU Scharff, W.; Erben, J. W.; Wolf, A.; Breuer, K.; Weissmantel, C.; Klabes,  
R.; Woittennek, H.; Heinig, K. H.; Voelskov, M.; et al.

CS Sekt. Phys./Elektron. Bauelemente, Tech. Hochsch. Karl-Marx-Stadt,  
Karl-Marx-Stadt, DDR-9010, Ger. Dem. Rep.

SO Physica Status Solidi A: Applied Research (1982), 74(2), 545-52  
CODEN: PSSABA; ISSN: 0031-8965

DT Journal  
LA English  
CC 76-3 (Electric Phenomena)  
Section cross-reference(s): 75

AB Crystn. of amorphous Si films deposited over surface-relief structures  
etched into SiO<sub>2</sub> layers is achieved by large-area processing with  
incoherent light pulses of 10 ms duration. The structures are either  
\*\*\*gratings\*\*\* with a const. top width of 3 .mu.m and bottoms with a  
width between 3 and 20 .mu.m or otherwise shaped artificial surface-relief  
micropatterns. The cryst. films consisted of very large crystallites,  
which are either sepd. from each other by grain boundaries or twinned to  
one another.

ST \*\*\*crystn\*\*\* \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* light  
IT Flash lamps  
Light, chemical and physical effects  
( \*\*\*crystn\*\*\* . by, of \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* films)

IT Semiconductor materials, \*\*\*amorphous\*\*\*  
( \*\*\*silicon\*\*\* films, flash-lamp-induced \*\*\*crystal\*\*\* growth  
of)

IT 7440-21-3, properties  
RL: PRP (Properties)  
(crystn. of amorphous films of, flash-lamp-induced)

IT 7631-86-9, uses and miscellaneous  
RL: USES (Uses)  
( \*\*\*crystn\*\*\* . of \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* films on,  
flash-lamp-induced)

L5 ANSWER 21 OF 36 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1979:515446 CAPLUS  
DN 91:115446  
ED Entered STN: 12 May 1984

TI \*\*\*Crystallographic\*\*\* orientation of \*\*\*silicon\*\*\* on an  
\*\*\*amorphous\*\*\* substrate using an artificial surface-relief  
\*\*\*grating\*\*\* and laser crystallization

AU Geis, M. W.; Flanders, D. C.; Smith, Henry I.  
CS Lincoln Lab., Massachusetts Inst. Technol., Lexington, MA, 02173, USA  
SO Applied Physics Letters (1979), 35(1), 71-4  
CODEN: APPLAB; ISSN: 0003-6951

DT Journal  
LA English  
CC 75-1 (Crystallization and Crystal Structure)

AB Uniform crystallog. orientation of Si films, 500 nm thick, was achieved on  
amorphous fused-SiO<sub>2</sub> substrates by laser crystn. of amorphous Si deposited  
over surface-relief \*\*\*gratings\*\*\* etched into the substrates. The  
\*\*\*gratings\*\*\* had a square-wave cross section with a 3.8-.mu.m spatial  
period and a 100-nm depth. The .ltbbrac.100.rtbbrac. directions in the Si  
were parallel to the \*\*\*grating\*\*\* and perpendicular to the substrate  
plane. Orientation of overlayer films induced by artificial surface  
patterns should be called graphoepitaxy.

ST graphoepitaxy silicon laser; \*\*\*grating\*\*\* artificial silicon epitaxy  
IT Nomenclature, new concepts  
(graphoepitaxy)

IT Laser radiation, chemical and physical effects  
(graphoepitaxy of silicon by)

IT Epitaxy  
(grapho-, of \*\*\*silicon\*\*\* on \*\*\*amorphous\*\*\* substrates)

IT 7440-21-3, properties  
RL: PRP (Properties)  
(orientation of epitaxial films of, on amorphous substrates, by  
artificial surface-relief \*\*\*grating\*\*\* and laser radiation)

L5 ANSWER 22 OF 36 INSPEC (C) 2006 IEE on STN  
AN 2005:8683626 INSPEC  
TI Microstructure of femtosecond laser-induced \*\*\*grating\*\*\* in  
\*\*\*amorphous\*\*\* \*\*\*silicon\*\*\*

AU Geon Joon Lee; Jisun Park; Eun Kyu Kim; YoungPak Lee (Dept. of Phys.,  
Hanyang Univ., Seoul, South Korea); Kyung Moon Kim; Hyeonsik Cheong; Chong  
Seung Yoon; Yong-Duck Son; Jin Jang

SO Optics Express (5 Sept. 2005) vol.13, no.18. 21 refs.  
Collection URL: <http://www.opticsexpress.org/>  
Published by: Opt. Soc. America  
Price: CCCC 1094-4087/2005/\$15.00  
CODEN: OPEXFF ISSN: 1094-4087

DT Journal  
TC Experimental  
CY United States  
LA English  
AB The femtosecond laser-induced \*\*\*grating\*\*\* (FLIG) formation and \*\*\*crystallization\*\*\* were investigated in \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* (a-Si) films, prepared on glass by plasma-enhanced chemical-vapor deposition. Probe-beam diffraction, micro-Raman spectroscopy, atomic force microscopy, scanning electron microscopy, and transmission electron microscopy were employed to characterize the diffraction properties and the microstructures of FLIGs. It was found that i) the FLIG can be regarded as a pattern of alternating a-Si and microcrystalline-silicon ( $\mu$ c-Si) lines with a period of about 2  $\mu$ m, and ii) efficient \*\*\*grating\*\*\* formation and crystallization were achieved by high-intensity recording with a short writing period.

CC A4280F Gratings, echelles; A4280W Ultrafast optical techniques; A4280X Optical coatings; A0779 Scanning probe microscopy and related techniques; A0780 Electron and ion microscopes and techniques; A4260F Laser beam modulation, pulsing and switching; mode locking and tuning; A7830G Infrared and Raman spectra in inorganic crystals; A8115H Chemical vapour deposition; A4262A Laser materials processing; A4285D Optical fabrication, surface grinding; B4360B Laser materials processing; B4190 Other optical system components; B4330B Laser beam modulation, pulsing and switching; mode locking and tuning

CT ATOMIC FORCE MICROSCOPY; CRYSTAL MICROSTRUCTURE; CRYSTALLISATION; DIFFRACTION \*\*\*GRATINGS\*\*\* ; HIGH-SPEED OPTICAL TECHNIQUES; LASER MATERIALS PROCESSING; OPTICAL FABRICATION; OPTICAL FILMS; PLASMA CVD COATINGS; SCANNING ELECTRON MICROSCOPY; SILICON; TRANSMISSION ELECTRON MICROSCOPY

ST \*\*\*femtosecond laser-induced grating microstructure\*\*\* ; \*\*\*amorphous\*\*\* \*\*\*silicon film\*\*\* ; crystallization; plasma-enhanced chemical-vapor deposition; probe-beam diffraction; microRaman spectroscopy; atomic force microscopy; scanning electron microscopy; transmission electron microscopy; microcrystalline-silicon; \*\*\*grating formation\*\*\* ; high-intensity recording; Si

CHI Si el  
ET Si

L5 ANSWER 23 OF 36 INSPEC (C) 2006 IEE on STN  
AN 2001:7065241 INSPEC DN A2001-22-4240-004; B2001-11-4350-018  
TI Reversible recording of interference \*\*\*gratings\*\*\* with a diffraction efficiency above 50% in an \*\*\*amorphous\*\*\* hydrogenized \*\*\*silicon\*\*\* -nematic liquid \*\*\*crystal\*\*\* structure.

AU Ivanova, N.L.; Onokhov, A.P.; Chaika, A.N. (Vavilov Opt. Inst., State Sci. Center of the Russian Federation, St. Petersburg, Russia)  
SO Technical Physics Letters (Aug. 2001) vol.27, no.8, p.647-8. 8 refs.  
Published by: MAIK Nauka  
Price: CCCC 1063-7850/2001/2708-0647\$21.00  
CODEN: TPLEED ISSN: 1063-7850  
SICI (Trl): 1063-7850(200108)27:8L.647:RRIG;1-S  
Translation of: Pis'ma v Zhurnal Tekhnicheskoi Fizika. 8 refs.  
CODEN: PZTFDD ISSN: 0320-0116

DT Journal; Translation Abstracted  
TC Experimental  
CY Russian Federation; Russian Federation  
LA English  
AB The properties of a space-time light modulator comprising an a-Si:H based p-i-n diode and a nematic liquid crystal layer were studied using a holographic technique. Under certain conditions, an asymmetry of the diffraction efficiency in the +1 and -1 diffraction orders was observed. The maximum diffraction efficiency in one of these orders may reach up to 52%, which is a record value for devices of this type.

CC A4240H Holographic recording; A4240E Holographic optical elements; holographic gratings; A4280K Optical beam modulators; B4350 Holography; B4150D Liquid crystal devices; B4250 Photoelectric devices

CT AMORPHOUS SEMICONDUCTORS; ELEMENTAL SEMICONDUCTORS; HOLOGRAPHIC \*\*\*GRATINGS\*\*\* ; HYDROGEN; NEMATIC LIQUID CRYSTALS; P-I-N PHOTODIODES;

RECORDING; SILICON; SPATIAL LIGHT MODULATORS

ST reversible recording; \*\*\*interference gratings\*\*\* ; diffraction efficiency; \*\*\*amorphous hydrogenized silicon-nematic liquid crystal\*\*\* structure\*\*\* ; space-time light modulator; a-Si:H based p-i-n diode; nematic liquid crystal layer; holographic technique; asymmetry; Si:H

CHI Si:H int, Si int, H int, Si:H bin, Si bin, H bin, Si el, H el, H dop

ET H\*Si; Si:H; H doping; doped materials; Si

L5 ANSWER 24 OF 36 INSPEC (C) 2006 IEE on STN

AN 1998:5883506 INSPEC DN A9810-8110J-001; B9805-0510-022

TI Optical and structural characterization of \*\*\*silicon\*\*\* microstructures fabricated by laser interference \*\*\*crystallization\*\*\*

AU Toet, D.; Aichmayr, G.; Mulato, M.; Santos, P.V.; Spangenberg, A.; Bergmann, R.B. (Max-Planck-Inst. fur Festkorperforschung, Stuttgart, Germany)

SO Amorphous and Microcrystalline Silicon Technology - 1997 Symposium Editor(s): Wagner, S.; Hack, M.; Schiff, E.A.; Schropp, R.; Shimizu, I. Pittsburgh, PA, USA: Mater. Res. Soc, 1997. p.337-42 of xx+978 pp. 11 refs.

Conference: San Francisco, CA, USA, 31 March-4 April 1997

ISBN: 1-55899-371-1

DT Conference Article

TC Experimental

CY United States

LA English

AB Uniform \*\*\*gratings\*\*\* of sharply defined polycrystalline silicon lines with micrometer-sized periods were created by laser interference \*\*\*crystallization\*\*\* of \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\*. Atomic force microscopy (AFM) reveals that lines fabricated with high pulse energies (380 mJ/cm<sup>2</sup>) contain large grains (dimensions up to 1.5  $\mu$ m), growing in a direction perpendicular to the lines. We assign this strong lateral growth to the melting of the material in the center of the lines combined with the presence of small grains, which act as nuclei, at the interfaces with the amorphous regions. Spatially resolved Raman spectroscopy shows that size effects dominate the Raman line shape at the edge of the line, confirming the AFM results, while stress increases towards the center of the line. The spectra measured in the middle of lines created with high energies show doping effects caused by the diffusion of boron atoms from the substrate upon exposure.

CC A8110J Growth from solid phases; A6470K Solid-solid transitions; A6150C Physics of crystal growth; A6180B Ultraviolet, visible and infrared radiation effects; A6820 Solid surface structure; A7830G Infrared and Raman spectra in inorganic crystals; A6480G Microstructure; B0510 Crystal growth; B2520C Elemental semiconductors; B2520F Amorphous and glassy semiconductors

CT AMORPHOUS SEMICONDUCTORS; ATOMIC FORCE MICROSCOPY; BORON; CRYSTALLISATION; DIFFUSION; ELEMENTAL SEMICONDUCTORS; GRAIN SIZE; INTERNAL STRESSES; LASER BEAM EFFECTS; RAMAN SPECTRA; SEMICONDUCTOR GROWTH; SILICON; SPECTRAL LINE BREADTH

ST optical characterization; structural characterization; silicon microstructures; laser interference crystallization; \*\*\*uniform\*\*\*

\*\*\* gratings\*\*\* ; sharply defined polycrystalline silicon lines; micrometer-sized periods; \*\*\*amorphous silicon\*\*\* ; atomic force microscopy; AFM; high pulse energies; large grains; lateral growth; melting; spatially resolved Raman spectroscopy; size effects; Raman line shape; stress; doping effects; diffusion; boron atoms; 1.5  $\mu$ m; Si:B

CHI Si:B bin, Si bin, B bin, Si el, B el, B dop

PHP size 1.5E-06 m

ET B\*Si; Si:B; B doping; doped materials; Si

L5 ANSWER 25 OF 36 INSPEC (C) 2006 FIZ KARLSRUHE on STN

AN 1996:5397270 INSPEC DN A9622-8160C-038; B9611-2550E-107

TI Extended resolution for lateral structuring with laser interference \*\*\*gratings\*\*\* using high-index input coupling.

AU Kelly, M.K.; Dahlheimer, B. (Walter Schottky Inst., Tech. Univ. Munchen, Garching, Germany)

SO Physica Status Solidi A (16 Aug. 1996) vol.156, no.2, p.K13-16. 7 refs. Published by: Akademie Verlag

Price: CCCC 0031-8965/96/\$3.50+0.25

CODEN: PSSABA ISSN: 0031-8965

SICI: 0031-8965(19960816)156:2L:k13:ERLS;1-G

DT Journal  
TC Experimental; Theoretical  
CY Germany, Federal Republic of  
LA English  
AB The usefulness of laterally structuring semiconductors directly with the thermal \*\*\*grating\*\*\* induced by a high-energy pulsed-laser interference pattern has recently been demonstrated for the diverse cases of \*\*\*crystallization\*\*\* in \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* films band-level modulation in MBE-grown quantum wells, and patterned etching of chemically inert GaN. For the simplest geometry, two plane-wave beams intersect at the substrate producing an intensity pattern of parallel lines with period determined by the wavelength and the angle between the beams. When this angle is maximized, for opposing beam directions, the minimum period of half-wavelength is obtained. Here we discuss the use of a modified geometry that permits extension of this resolution by coupling the light into the substrate through a medium with refractive index higher than one, effectively reducing the wavelength of the incident light. By this technique a period of 125 nm has been achieved using the 355 nm third harmonic from a Nd:YAG laser.

CC A8160C Surface treatment and degradation of semiconductors; A6180B Ultraviolet, visible and infrared radiation effects; A6820 Solid surface structure; A7920D Laser-surface impact phenomena; A4280F Gratings, echelles; A7865J Optical properties of nonmetallic thin films; A7820D Optical constants and parameters; B2550E Surface treatment for semiconductor devices; B2520D II-VI and III-V semiconductors

CT ATOMIC FORCE MICROSCOPY; DIFFRACTION \*\*\*GRATINGS\*\*\* ; GALLIUM ARSENIDE; III-V SEMICONDUCTORS; INTERFACE PHENOMENA; LASER BEAM EFFECTS; LIGHT INTERFERENCE; REFLECTIVITY; REFRACTIVE INDEX; SURFACE STRUCTURE; SURFACE TREATMENT

ST lateral structuring; semiconductor surface treatment; \*\*\*laser\*\*\*  
\*\*\* interference gratings\*\*\* ; high index input coupling; intensity pattern; modified geometry; refractive index; Nd:YAG laser; 125 nm; 355 nm; GaAs

CHI GaAs sur, As sur, Ga sur, GaAs bin, As bin, Ga bin  
PHP size 1.25E-07 m; wavelength 3.55E-07 m  
ET Ga\*N; GaN; Ga cp; cp; N cp; Nd; V; As\*Ga; As sy 2; sy 2; Ga sy 2; GaAs; As cp; As; Ga

L5 ANSWER 26 OF 36 INSPEC (C) 2006 IEE on STN  
AN 1996:5156701 INSPEC DN A9604-4240-001; B9602-4350-073  
TI Reversible recording of holograms on hydrogenated \*\*\*amorphous\*\*\*  
\*\*\*silicon\*\*\* /liquid \*\*\*crystal\*\*\* structures.

AU Chaika, A.N.; Ivanova, N.L.; Onokhov, A.P.; Nefed'eva, E.A. (S.I. Vavilov State Opt. Inst., All-Russia Sci. Center, St. Petersburg, Russia)  
SO Technical Physics Letters (Oct. 1995) vol.21, no.10, p.808-9. 3 refs.  
Published by: AIP  
Price: CCCC 1063-7850/95/100808-02\$10.00  
CODEN: TPLEED ISSN: 1063-7850  
SICI (Trl): 1063-7850(199510)21:10L.808:RRHH;1-K  
Translation of: Pis'ma v Zhurnal Tekhnicheskoi Fizika (Oct. 1995) vol.21, no.19-20, p.83-7. 3 refs.  
CODEN: PZTFDD ISSN: 0320-0108  
SICI: 0320-0108(199510)21:19/20L.83;1-X

DT Journal; Translation Abstracted  
TC Experimental  
CY Russian Federation; United States  
LA English  
AB Structures of the photosemiconductor/liquid crystal (PS/LC) type, which have a high sensitivity and spatial resolution at relatively low excitation voltages have found wide use in developing optically addressed space-time light modulators for devices used in optical processing of information. Among a large number of such structures, of particular importance are layers based on hydrogenated \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* in conjunction with liquid \*\*\*crystals\*\*\* (a-Si:H-LC structures), which are very fast while retaining the requisite level of the other parameters. The main function of modulators based on this type of structure is to input images into coherent optical processors in real time. The development of the architecture of modern processors and optical neuron networks has brought to the fore the problem of creating fast modulators to permit reversible holographic recording of information. Optimization of the structure parameters with a photosensitive layer of a-Si:H has allowed us to achieve the required spatial resolution and write and read out holograms in real time. The space-time light modulators that

we used were multilayer sandwich structures between two glass substrates.  
 CC A4240H Holographic recording; A4280K Optical beam modulators; A4240E  
 Holographic optical elements; holographic gratings; A4280F Gratings,  
 echelles; A4240F Image characteristics in holography; B4350 Holography;  
 B4150D Liquid crystal devices  
 CT AMORPHOUS SEMICONDUCTORS; ELECTRO-OPTICAL MODULATION; ELEMENTAL  
 SEMICONDUCTORS; HOLOGRAPHIC \*\*\*GRATINGS\*\*\* ; HOLOGRAPHY; HYDROGEN;  
 LIQUID CRYSTAL DEVICES; SILICON; SPATIAL LIGHT MODULATORS  
 ST holograms; reversible recording; photosemiconductor/liquid crystal type  
 crystals; sensitivity; spatial resolution; optically addressed space-time  
 light modulators; optical processing; a-Si:H-liquid crystal structures;  
 images; coherent optical processors; optical neuron networks; structure  
 parameters; photosensitive layer; read out holograms; space-time light  
 modulators; multilayer sandwich structures; write holograms; Si:H  
 CHI Si:H bin, Si bin, H bin, Si el, H el, H dop; Si int, H int, Si ss, H ss, H  
 bin, Si el, H dop  
 ET H\*Si; Si:H; H doping; doped materials; Si

L5 ANSWER 27 OF 36 INSPEC (C) 2006 IEE on STN  
 AN 1993:4376076 INSPEC DN A9309-8630J-012; B9305-8420-015  
 TI \*\*\*Amorphous\*\*\* \*\*\*silicon\*\*\* /polycrystalline Si tandem type solar  
 cells.  
 AU Takakura, H. (Dept. of Electron. & Inf., Toyama Prefectural Univ., Japan);  
 Ma, W.; Okamoto, H.; Hamakawa, Y.  
 SO Oyo Buturi (Oct. 1992) vol.61, no.10, p.1026-30. 22 refs.  
 CODEN: OYBSA9 ISSN: 0369-8009  
 DT Journal  
 TC Theoretical  
 CY Japan  
 LA Japanese  
 AB The theoretical conversion efficiency of tandem-type solar cells is  
 reviewed. Among various material combinations of tandem-type solar cells,  
 that of \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* and \*\*\*crystalline\*\*\*  
 \*\*\*silicon\*\*\* is recognized to be one of the best combinations from the  
 viewpoints of high theoretical efficiency and ease of material preparation  
 and device processing. The present status of this type of solar cell is  
 introduced and future prospects are discussed.  
 CC A8630J Photoelectric conversion; solar cells and arrays; A8115H Chemical  
 vapour deposition; B8420 Solar cells and arrays; B0520F Vapour deposition  
 CT AMORPHOUS SEMICONDUCTORS; ELEMENTAL SEMICONDUCTORS; SILICON; SOLAR CELLS  
 ST a-Si/polycrystalline Si; semiconductor; ECR-CVD; \*\*\*optical coupler\*\*\*  
 ; conversion efficiency; tandem-type solar cells; material combinations;  
 material preparation; device processing; Si  
 CHI Si int, Si el  
 ET Si

L5 ANSWER 28 OF 36 INSPEC (C) 2006 IEE on STN  
 AN 1987:2958029 INSPEC DN A87110543  
 TI Molybdenum-silicon multilayer monochromator for the extreme ultraviolet.  
 AU Barbee, T.W., Jr. (Lawrence Livermore Nat. Lab., CA, USA); Pianetta, P.;  
 Redaelli, R.; Tatchyn, R.; Barbee, T.W., III  
 SO Applied Physics Letters (22 June 1987) vol.50, no.25, p.1841-3. 18 refs.  
 Price: CCCC 0003-6951/87/251841-03\$01.00  
 CODEN: APPLAB ISSN: 0003-6951  
 DT Journal  
 TC Experimental  
 CY United States  
 LA English  
 AB A two-element molybdenum-silicon multilayer monochromator has been tested  
 in the energy range 60-110 eV on a differentially pumped bending magnet  
 beamline having a high-energy cutoff of 3.5 keV at the Stanford  
 Synchrotron Radiation Laboratory. The multilayer structures were sputter  
 deposited onto 5-cm-diam (111) single- \*\*\*crystal\*\*\* \*\*\*silicon\*\*\*  
 and contained 20 molybdenum layers (4.93 nm thick) separated by  
 \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* layers (7.8 nm thick). A 1200 1/mm  
 gold transmission \*\*\*grating\*\*\* was used to independently measure the  
 wavelength passed by the monochromator. The Al L<sub>2,3</sub> absorption edge jump  
 was also measured using the monochromator. These experimental results are  
 compared to model calculations for both the synchrotron  
 source-monochromator and the synchrotron source-monochromator-Al filter  
 configurations and excellent agreement is shown.  
 CC A4280D Monochromators



CT ELEMENTAL SEMICONDUCTORS; MOLYBDENUM; MONOCHROMATORS; SILICON  
ST semiconductor; extreme ultraviolet; sputter deposited; model calculations;  
Mo-Si multilayer monochromator; \*\*\*Au transmission grating\*\*\*  
CHI Mo-Si int, Mo int, Si int, Mo el, Si el; Au el  
ET Al; Mo\*Si; Mo sy 2; sy 2; Si sy 2; Mo-Si; Au; Mo; Si

L5 ANSWER 29 OF 36 INSPEC (C) 2006 IEE on STN  
AN 1987:2793648 INSPEC DN A87011034  
TI The diffraction of light by transient \*\*\*gratings\*\*\* in  
\*\*\*crystalline\*\*\*, ion-implanted, and \*\*\*amorphous\*\*\*  
\*\*\*silicon\*\*\*.

AU Vaitkus, J.; Harasiunas, K.; Gaubas, E.; Jonikas, L.; Pranaitis, R. (Dept.  
of Semicond. Phys., Vilnius V. Kapsukas State Univ., Lithuanian SSR,  
USSR); Subacius, L.  
SO IEEE Journal of Quantum Electronics (Aug. 1986) vol.QE-22, no.8,  
p.1298-305. 28 refs.  
Price: CCCC 0018-9197/86/0800-1298\$01.00  
CODEN: IEJQA7 ISSN: 0018-9197  
DT Journal  
TC Theoretical; Experimental  
CY United States  
LA English  
AB The results of applying the transient \*\*\*grating\*\*\* technique to  
single \*\*\*crystals\*\*\* of \*\*\*silicon\*\*\* are analyzed, taking into  
account free-carrier absorption and nonlinear recombination. Using  
different configurations of this technique, the exposure and decay  
characteristics of \*\*\*gratings\*\*\* in the volume or surface of silicon  
of different properties (pure, doped with deep or shallow traps, ion  
implanted, or amorphous) are investigated. The presence of impurities does  
not change the dominant mechanism of refractive index modulation by the  
photogenerated nonequilibrium carriers. Increase damage of Si leads to a  
decrease in carrier diffusion (implanted Si) with, in the case of  
amorphous Si, domination of \*\*\*grating\*\*\* decay by carrier  
recombination. The properties of \*\*\*gratings\*\*\* in high external DC or  
AC (microwave) electric fields allows the evaluation of hot-carrier  
diffusion coefficients.

CC A4265 Nonlinear optics; A4280F Gratings, echelles; A7220J Charge carriers:  
generation, recombination, lifetime, and trapping  
CT AMORPHOUS SEMICONDUCTORS; DIFFRACTION \*\*\*GRATINGS\*\*\*; ELEMENTAL  
SEMICONDUCTORS; LIGHT DIFFRACTION; NONLINEAR OPTICS; SILICON  
ST crystalline Si; microwave electric fields; ion-implanted Si;  
semiconductor; deep traps; \*\*\*transient grating\*\*\*; single crystals;  
free-carrier absorption; nonlinear recombination; decay characteristics;  
shallow traps; refractive index modulation; photogenerated nonequilibrium  
carriers; implanted Si; amorphous Si; hot-carrier diffusion coefficients  
ET Si

L5 ANSWER 30 OF 36 INSPEC (C) 2006 IEE on STN  
AN 1986:2760589 INSPEC DN A86121627  
TI Light-induced light diffraction in \*\*\*crystalline\*\*\* and  
\*\*\*amorphous\*\*\* \*\*\*silicon\*\*\*.

AU Vaitkus, Yu.; Yarashyunas, K.; Gaubas, E.; Tinfavichyus, E.; Kulevichyus,  
Ch.; Mishkinis, Yu. (V. Kapsukas Vilnius State Univ., Lithuanian SSR,  
USSR)  
SO Bulletin of the Academy of Sciences of the USSR, Physical Series (1985)  
vol.49, no.6, p.126-31. 20 refs.  
Price: CCCC 0001-432X/85/\$20.00  
CODEN: BUPSA4 ISSN: 0001-432X  
Translation of: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya (1985)  
vol.49, no.6, p.1173-8. 20 refs.  
CODEN: IANFAY ISSN: 0367-6765  
Conference: Proceedings of the Sixth All-Union Conference on the  
Nonresonant Interaction of Optical Radiation with Matter. Palanga, USSR,  
18-22 Sept 1984  
DT Conference Article; Journal; Translation Abstracted  
TC Experimental  
CY USSR; United States  
LA English  
AB Interest in light-induced \*\*\*gratings\*\*\* is due to their widespread  
use in adaptive and nonlinear optics. Silicon can serve as a model medium  
for determining various physical processes in the light-induced  
\*\*\*gratings\*\*\* method, while analysis of the \*\*\*grating\*\*\* recording

and reading conditions, and measurement of the nonequilibrium charge carrier concentration (NCC) parameters and of the Delta n modulation mechanisms reveal the possibilities of the dynamic \*\*\*gratings\*\*\* procedure generally.

CC A4260H Laser beam characteristics and interactions; A4265 Nonlinear optics; A4280F Gratings, echelles

CT AMORPHOUS SEMICONDUCTORS; CARRIER DENSITY; DIFFRACTION \*\*\*GRATINGS\*\*\* ; ELEMENTAL SEMICONDUCTORS; LASER BEAM EFFECTS; NONLINEAR OPTICS; SILICON

ST crystalline Si; \*\*\*grating reading\*\*\* ; elemental semiconductor; adaptive optics; light induced light diffraction; nonlinear optics; physical processes; \*\*\*light-induced gratings method\*\*\* ; \*\*\*grating\*\*\*

\*\*\* recording\*\*\* ; nonequilibrium charge carrier concentration; modulation mechanisms; \*\*\*dynamic gratings procedure\*\*\*

ET Si

L5 ANSWER 31 OF 36 INSPEC (C) 2006 IEE on STN

AN 1984:2283150 INSPEC DN A84080452

TI Epitaxial \*\*\*crystallization\*\*\* of \*\*\*silicon\*\*\* films deposited on GaP substrates during laser interference annealing.

AU Koval'chuk, Yu.V.; Portnoi, E.L.; Skopina, V.I.; Smirnitskii, V.B.; Smol'skii, O.V.; Sokolov, I.A. (A.F. Ioffe Physicotech. Inst., Acad. of Sci., Leningrad, USSR)

SO Soviet Technical Physics Letters (July 1983) vol.9, no.7, p.365-6. 5 refs. Price: CCCC 0360-120X/83/070365-02\$02.60 CODEN: STPLD2 ISSN: 0360-120X Translation of: Pis'ma v Zhurnal Tekhnicheskoi Fizika (July 1983) vol.9, no.13-14, p.850-3. 5 refs. CODEN: PZTFDD ISSN: 0320-0108

DT Journal; Translation Abstracted

TC Experimental

CY USSR; United States

LA English

AB The authors report a continuation of a study of the epitaxial crystallization of deposited amorphous films of semiconductor materials subjected to laser pulses under conditions of interference annealing. In contrast with the previous paper (see *ibid.*, vol.8, p.201, 1982), where the occurrence of crystallization was monitored on the basis of the diffraction efficiency of the resulting \*\*\*gratings\*\*\*, in the present experiments they studied the shape of the lines of the \*\*\*grating\*\*\* for various bombardment conditions. Laser beams bombarded \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* films deposited on single-\*\*\*crystal\*\*\* GaP substrates oriented in the (111) and the (100) planes. The deposition was carried out by ion-plasma sputtering of a single-\*\*\*crystal\*\*\* \*\*\*silicon\*\*\* target in an argon atmosphere on a planar DC magnetron. For the annealing they used a ruby laser ( $\lambda = 0.69 \mu\text{m}$ ) in Q-switched operation ( $\tau \text{ pulse} = 50 \text{ ns}$ ) with an approximately Gaussian spatial distribution of radiant energy.

CC A6180B Ultraviolet, visible and infrared radiation; A6855 Thin film growth, structure, and epitaxy; A6860 Physical properties of thin films, nonelectronic; A8115C Deposition by sputtering

CT AMORPHOUS SEMICONDUCTORS; CRYSTALLISATION; ELEMENTAL SEMICONDUCTORS; GALLIUM COMPOUNDS; III-V SEMICONDUCTORS; LASER BEAM ANNEALING; SEMICONDUCTOR EPITAXIAL LAYERS; SILICON; SPUTTERED COATINGS; SUBSTRATES

ST Si; GaP substrates; laser interference annealing; epitaxial crystallization; amorphous films; semiconductor; laser pulses; \*\*\*gratings\*\*\* ; single-crystal; ion-plasma sputtering; planar DC magnetron; ruby laser; Q-switched operation; Gaussian spatial distribution; radiant energy

ET Ga\*P; GaP; Ga cp; cp; P cp; V; Si

L5 ANSWER 32 OF 36 INSPEC (C) 2006 IEE on STN

AN 1984:2204193 INSPEC DN B84013366

TI Graphoepitaxy.

AU Furukawa, S. (Tokyo Inst. of Technol., Yokohama-shi, Japan)

SO Journal of the Institute of Electronics and Communication Engineers of Japan (May 1983) vol.66, no.5, p.486-9. 10 refs. CODEN: IECJAJ ISSN: 0373-6121

DT Journal

TC Practical

CY Japan

LA Japanese

AB The need for silicon on insulation structures is put down to energy

consumption, speed and VLSI considerations. The construction of circuits on noncrystal bases with relief is reviewed. \*\*\*Crystallographic\*\*\* orientation of \*\*\*silicon\*\*\* on an \*\*\*amorphous\*\*\* substrate using an artificial relief \*\*\*grating\*\*\* and laser crystallisation is described. Future developments are expected in large single chip collision over SiO<sub>2</sub> by lateral epitaxy, seeded solidification and zone melting and recrystallisation of the encapsulated Si film. The electrical properties of the product are briefly reviewed.

CC B0510D Epitaxial growth; B2550 Semiconductor device technology; B2570 Semiconductor integrated circuits

CT INTEGRATED CIRCUIT TECHNOLOGY; LARGE SCALE INTEGRATION; SEMICONDUCTOR EPITAXIAL LAYERS; SEMICONDUCTOR GROWTH

ST IC manufacture; graphoeptitaxy; energy consumption; speed; VLSI; noncrystal bases; relief; amorphous substrate; \*\*\*artificial relief grating\*\*\* ; laser crystallisation; SiO<sub>2</sub>; lateral epitaxy; seeded solidification; zone melting; recrystallisation; encapsulated Si film

ET O\*Si; SiO<sub>2</sub>; Si cp; cp; O cp; Si

  

L5 ANSWER 33 OF 36 INSPEC (C) 2006 IEE on STN

AN 1983:2016226 INSPEC DN A83033602; B83017379

TI Flash-lamp-induced \*\*\*crystal\*\*\* growth of \*\*\*silicon\*\*\* on \*\*\*amorphous\*\*\* substrates using artificial surface-relief structures.

AU Scharff, W.; Erben, J.W.; Wolf, A.; Breuer, K.; Weissmantel, C. (Sektion Phys./Elektronische Bauelemente, Tech. Hochschule, Karl-Marx-Stadt, East Germany); Klabes, R.; Woittennek, H.; Heinig, K.H.; Voelskov, M.; Matthai, J.; Schmidt, A.

SO Physica Status Solidi A (16 Dec. 1982) vol.74, no.2, p.545-52. 9 refs. CODEN: PSSABA ISSN: 0031-8965

DT Journal

TC Experimental

CY German Democratic Republic

LA English

AB \*\*\*Crystallization\*\*\* of \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* films deposited over surface-relief structures etched into SiO<sub>2</sub> layers is achieved by large area processing with incoherent light pulses of 10 ms duration. The structures are either \*\*\*gratings\*\*\* with a constant top width of 3  $\mu$ m and bottoms with a width between 3 and 20  $\mu$ m or otherwise shaped artificial surface-relief micropatterns. The crystalline films are found to consist of very large crystallites, which are either separated from each other by grain boundaries or twinned to one another.

CC A6180 Radiation damage and other irradiation effects; A6855 Thin film growth, structure, and epitaxy; B0520 Thin film growth; B2520C Elemental semiconductors; B2520F Amorphous and glassy semiconductors

CT AMORPHOUS SEMICONDUCTORS; CRYSTALLISATION; CRYSTALLITES; ELEMENTAL SEMICONDUCTORS; RADIATION EFFECTS; SEMICONDUCTOR THIN FILMS; SILICON

ST amorphous Si films; flash lamp induced crystal growth; etched SiO<sub>2</sub>; semiconductor; surface-relief structures; SiO<sub>2</sub> layers; incoherent light pulses; \*\*\*gratings\*\*\* ; shaped artificial surface-relief micropatterns; crystallites; grain boundaries; twinned

ET O\*Si; SiO<sub>2</sub>; Si cp; cp; O cp; Si

  

L5 ANSWER 34 OF 36 INSPEC (C) 2006 IEE on STN

AN 1981:1757155 INSPEC DN A81096955; B81045092

TI Silicon graphoeptitaxy.

AU Geis, M.W.; Antoniadis, D.A.; Silversmith, D.J.; Mountain, R.W.; Smith, H.I. (Lincoln Lab., MIT, Lexington, MA, USA)

SO Journal of Vacuum Science and Technology (March 1981) vol.18, no.2, p.229-30. 5 refs. CODEN: JVSTAL ISSN: 0022-5355

Conference: Proceedings of the 27th National Symposium of the American Vacuum Society. Detroit, MI, USA, 13-17 Oct 1980

DT Conference Article; Journal

TC Experimental

CY United States

LA English

AB Summary form only is given. Recently the authors reported on the use of a strip-heater oven to achieve graphoeptitaxy of \*\*\*silicon\*\*\* films over relief \*\*\*gratings\*\*\* in \*\*\*amorphous\*\*\* SiO<sub>2</sub>. Here they briefly review the strip-heater oven technique and compare the \*\*\*crystallographic\*\*\* and electrical properties of the \*\*\*silicon\*\*\* films obtained with the properties of films obtained by laser crystallization over relief \*\*\*gratings\*\*\*. The strip-heater oven,

consists of two carbon strips 50\*75\*1.2 mm that are resistively heated by passing 200-350 A through them. The sample, which is placed on the lower strip heater, consists of a substrate with a deposited film of silicon and a deposited film or 'cap' of SiO<sub>2</sub>. (This cap was found to be necessary in order to achieve graphoepitaxy.) The substrate is either fused silica or thermally grown SiO<sub>2</sub> (usually approximately 1  $\mu$ m thick) on a silicon wafer. A relief \*\*\*grating\*\*\* of square-wave cross section is etched 100 nm deep into the SiO<sub>2</sub>. The \*\*\*grating\*\*\* periods used to date have been in the range 1-4  $\mu$ m. The sample is heated on the lower strip to 1100 degrees -1300 degrees C, after which additional radiational heating by the upper strip causes a \*\*\*crystallization\*\*\* transition to occur in the \*\*\*silicon\*\*\*. After this transition, the mean (100) crystallographic directions are perpendicular to the substrate and parallel to the \*\*\*grating\*\*\* axis. The entire crystallization process requires about 40-60 s. The graphoepitaxial silicon films produced either by a strip-heater oven or laser crystallization are mosaics with crystallites having a range of orientations relative to the substrate normal and the \*\*\*grating\*\*\* axis.

- CC A6855 Thin film growth, structure, and epitaxy; A7280C Elemental semiconductors; A7360F Semiconductor films; B0510D Epitaxial growth; B2520C Elemental semiconductors
- CT ELECTRONIC CONDUCTION IN CRYSTALLINE SEMICONDUCTOR THIN FILMS; ELEMENTAL SEMICONDUCTORS; EPITAXIAL GROWTH; SEMICONDUCTOR GROWTH; SILICON
- ST graphoepitaxy; strip-heater oven; \*\*\*relief gratings\*\*\*; amorphous SiO<sub>2</sub>; electrical properties; crystallization transition; Si; electrical characterisation; semiconductor; crystallographic properties
- ET O\*Si; SiO<sub>2</sub>; Si cp; cp; O cp; C; Si
- L5 ANSWER 35 OF 36 INSPEC (C) 2006 IEE on STN
- AN 1980:1543057 INSPEC DN A80070554; B80034753
- TI Grapho-epitaxy of silicon on fused silica using surface micropatterns and laser crystallization.
- AU Geis, M.W.; Flanders, D.C.; Smith, H.I. (Lincoln Lab., MIT, Lexington, MA, USA); Antoniadis, D.A.
- SO Journal of Vacuum Science and Technology (Nov.-Dec. 1979) vol.16, no.6, p.1640-3. 12 refs.  
CODEN: JVSTAL ISSN: 0022-5355  
Conference: Proceedings of the 15th Symposium on Electron, Ion, and Photon Beam Technology. Boston, MA, USA, 29 May-1 June 1979
- DT Conference Article; Journal
- TC Experimental
- CY United States
- LA English
- AB Uniform \*\*\*crystallographic\*\*\* orientation of \*\*\*silicon\*\*\* films, 0.5  $\mu$ m thick, has been achieved on amorphous fused silica substrates by laser \*\*\*crystallization\*\*\* of \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\* deposited over surface-relief \*\*\*gratings\*\*\* etched into the substrates by reactive ion etching. The \*\*\*gratings\*\*\* had a square-wave cross section with a 3.8  $\mu$ m spatial period, a 100-nm depth and corner radii of about 5 nm. The (100) directions in the silicon were parallel to the \*\*\*grating\*\*\* to within +or-15 degrees, and perpendicular to the substrate plane to within +or-2.5 degrees. A simple model for the graphoepitaxy process is presented. Sheet resistivity of phosphorus doped graphoepitaxial silicon was 2.5 times larger than that of bulk silicon of the same doping. Graphoepitaxy is a new application of microstructure fabrication that may lead to new combinations of substrates and overlayer films, and perhaps to three-dimensionally integrated electronic devices and other novel configurations.
- CC A6855 Thin film growth, structure, and epitaxy; A7920D Laser-light impact phenomena; A8110J Growth from solid phases; A8115 Methods of thin film deposition; A8140G Other heat and thermomechanical treatments; A8140R Electrical and magnetic properties (related to treatment conditions); B0510D Epitaxial growth; B2520C Elemental semiconductors; B2550 Semiconductor device technology; B4360 Laser applications
- CT ANNEALING; CRYSTALLISATION; ELECTRONIC CONDUCTION IN CRYSTALLINE SEMICONDUCTOR THIN FILMS; ELEMENTAL SEMICONDUCTORS; EPITAXIAL GROWTH; LASER BEAM EFFECTS; SEMICONDUCTOR EPITAXIAL LAYERS; SEMICONDUCTOR GROWTH; SILICON
- ST surface micropatterns; laser crystallization; graphoepitaxy; elemental semiconductor; Si; \*\*\*surface relief gratings\*\*\*; fused SiO<sub>2</sub> substrate; sheet resistivity; amorphous Si; Si:P
- ET Si; O\*Si; SiO<sub>2</sub>; Si cp; cp; O cp; P\*Si; Si:P; P doping; doped materials

L5 ANSWER 36 OF 36 INSPEC (C) 2006 IEE on STN  
AN 1979:1421525 INSPEC DN A79095277; B79045911  
TI \*\*\*Crystallographic\*\*\* orientation of \*\*\*silicon\*\*\* on an  
\*\*\*amorphous\*\*\* substrate using an artificial surface-relief  
\*\*\*grating\*\*\* and laser crystallization.  
AU Geis, M.W.; Flanders, D.C.; Smith, H.I. (Lincoln Lab., MIT, MA, USA)  
SO Applied Physics Letters (1 July 1979) vol.35, no.1, p.71-4. 15 refs.  
CODEN: APPLAB ISSN: 0003-6951  
DT Journal  
TC Experimental  
CY United States  
LA English  
AB Uniform \*\*\*crystallographic\*\*\* orientation of \*\*\*silicon\*\*\* films,  
500 nm thick, has been achieved on amorphous fused-silica substrates by  
laser \*\*\*crystallization\*\*\* of \*\*\*amorphous\*\*\* \*\*\*silicon\*\*\*  
deposited over surface-relief \*\*\*gratings\*\*\* etched into the  
substrates. The \*\*\*gratings\*\*\* had a square-wave cross section with a  
3.8-  $\mu$ m spatial period and a 100-nm depth. The (100) directions in the  
silicon were parallel to the \*\*\*grating\*\*\* and perpendicular to the  
substrate plane. The authors propose that orientation of overlayer films  
induced by artificial surface patterns be called graphoepitaxy.  
CC A6855 Thin film growth, structure, and epitaxy; A8110J Growth from solid  
phases; A8115 Methods of thin film deposition; B0520 Thin film growth  
CT CRYSTALLISATION; ELEMENTAL SEMICONDUCTORS; EPITAXIAL GROWTH; LASER BEAM  
EFFECTS; SEMICONDUCTOR GROWTH; SEMICONDUCTOR THIN FILMS; SILICON  
ST amorphous substrate; laser crystallization; crystallographic orientation;  
graphoepitaxy; Si film; \*\*\*surface relief gratings\*\*\*  
ET Si

=> d his

(FILE 'HOME' ENTERED AT 08:01:12 ON 26 JAN 2006)

FILE 'STNGUIDE' ENTERED AT 08:01:20 ON 26 JAN 2006

FILE 'HOME' ENTERED AT 08:01:24 ON 26 JAN 2006

FILE 'CAPLUS, INSPEC' ENTERED AT 08:01:32 ON 26 JAN 2006

L1 142298 S (GRATING OR COUPLER OR DFG)  
L2 0 S CRYSTAL?(5A)SILICON  
L3 72758 S CRYSTAL?(5A)SILICON  
L4 63412 S AMORPHOUS(5A)SILICON  
L5 36 S L1 AND L3 AND L4

=> s l1 and (ion(5a)(implant? or bombard? or dop?))  
L6 744 L1 AND (ION(5A)(IMPLANT? OR BOMBARD? OR DOP?))

=> s l6 and (si or silicon or soi)  
L7 187 L6 AND (SI OR SILICON OR SOI)

=> d all 1-187

L7 ANSWER 1 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 2006:16175 CAPLUS  
ED Entered STN: 08 Jan 2006  
TI High speed 2 .times. 2 optical switch in \*\*\*silicon\*\*\* -on-insulator  
based on plasma dispersion effect  
AU Sun, Fei; Yu, Jin-Zhong; Chen, Shao-Wu  
CS National Key Laboratory on Integrated Optoelectronics, Institute of  
Semiconductors, Chinese Academy of Sciences, Beijing, 100083, Peop. Rep.  
China  
SO Chinese Physics Letters (2005), 22(12), 3097-3099  
CODEN: CPLEEU; ISSN: 0256-307X  
PB Chinese Physical Society  
DT Journal  
LA English  
CC 73 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
AB Based on free carrier plasma dispersion effect, a 2.times.2 optical switch  
is fabricated in a \*\*\*silicon\*\*\* -on-insulator substrate by inductively  
coupled-plasma technol. and \*\*\*ion\*\*\* \*\*\*implantation\*\*\*. The

device has a Mach-Zehnder interferometer structure, in which two directional \*\*\*couplers\*\*\* serve as the power splitter and combiner. The switch presents an insertion loss of 3.04 dB and a response time of 496 ns.

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

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- (2) Cutolo, A; J Lightwave Technol 1997, V15, P505 CAPLUS
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- (4) Dainesi, P; IEEE Photon Technol Lett 2000, V12, P660
- (5) Espinola, R; IEEE Photon Technol Lett 2003, V15, P1366
- (6) Fischer, U; Electron Lett 1994, V30, P406 CAPLUS
- (7) Fischer, U; Proceedings 1995 IEEE International SOI Conference 1995, V35, P141
- (8) Giguere, S; J Appl Phys 1990, V68, P4964 CAPLUS
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- (10) Li, Y; Chin Phys Lett 2005, V22, P621 CAPLUS
- (11) Li, Y; IEEE Photon Technol Lett 2005, V17, P1641 CAPLUS
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- (13) Soref, R; IEEE J Quantum Electron 1987, V23, P123
- (14) Soref, R; IEEE J Quantum Electron 1991, V27, P1971 CAPLUS
- (15) Xia, J; Opt Commun 2004, V232, P223 CAPLUS
- (16) Yang, D; Opt Commun 2005, V250, P48 CAPLUS

L7 ANSWER 2 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2005:1284944 CAPLUS

ED Entered STN: 08 Dec 2005

TI Room-temperature luminescence from Er-doped SiOx films containing

\*\*\*Si\*\*\* nanoparticles

AU Chen, Wei-de; Chen, Chang-yong; Bian, Liu-fang

CS Institute of Semiconductors, Chinese Academy of Sciences, Beijing, 100083, Peop. Rep. China

SO Faguang Xuebao (2005), 26(5), 647-650

CODEN: FAXUEW; ISSN: 1000-7032

PB Kexue Chubanshe

DT Journal

LA Chinese

CC 73 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB Er3+ photoluminescence (PL) in \*\*\*silicon\*\*\* -based materials has been

attracting much interest because of its potential application in

\*\*\*Si\*\*\* -based optoelectronic devices. Er3+ \*\*\*ions\*\*\* can be

\*\*\*doped\*\*\* into different hosts, such as cryst. \*\*\*silicon\*\*\*,

hydrogenated amorphous \*\*\*silicon\*\*\* suboxide (a-SiOx:H), SiO2 film

contg. \*\*\*Si\*\*\* nanocrystals and so on. In this report PL properties

of undoped and Er3+-doped SiOx films contg. amorphous \*\*\*Si\*\*\*

nanoparticles were studied. A-SiOx films contg. \*\*\*Si\*\*\*

nanoparticles were prepd. by plasma enhanced chem. vapor deposition

(PECVD) using a gas source with mixt. of SiH4 and N2O. Erbium

\*\*\*ions\*\*\* were \*\*\*implanted\*\*\* into as-deposited SiOx films at 500

keV with a varying dose range of (1 .apprx. 3) .times. 1015/cm2 and then

annealed at 300 .apprx. 900 .degree.C for 30 s under N2. Visible PL

expts. were performed with a Dilor XY-800 triple \*\*\*grating\*\*\*

spectrometer with a charge-coupled device (CCD) detector. The samples

were excited by 514.5 nm line of Ar+ laser. The Er3+ IR PL spectra were

measured using FTIR spectrometer (Bruker IFS120HR). The wavelength of Ar+

laser is 514.5 .mu.m and the nominal laser power was 200 mW. The results

showed that the PL intensity from nc- \*\*\*Si\*\*\* in SiO2 at 750 nm is one

order of magnitude stronger than that from amorphous \*\*\*silicon\*\*\*

clusters in a-SiOx:H, and the PL intensity from Er3+ at 1.54 .mu.m in Er

doped a-SiOx:H is a factor of 4 higher than that in Er doped SiO2. The PL

and crystallinity of a-SiOx:H as function of annealing temp. were also

studied. In combination with the Raman measurement, the results show that

photoluminescence from amorphous \*\*\*Si\*\*\* nanoparticles also follows

the quantum confinement model as in \*\*\*Si\*\*\* -nanocrystals. Our study

indicates that a competitive relationship between the light emissions of

a- \*\*\*Si\*\*\* clusters and Er3+ in the Er-doped a-SiOx:H film is also

present and the films yield efficient Er3+ emission even superior to that

of Er doped SiO2 contg. \*\*\*Si\*\*\* nanocrystals, suggesting a- \*\*\*Si\*\*\*

clusters can also act as both the absorbing medium and sensitizer in Er3+

excitation as nc- \*\*\*Si\*\*\* in Er doped SiO2. Er3+ emission intensity

does not depend strongly upon whether it is nc- \*\*\*Si\*\*\* or a-

\*\*\*Si\*\*\* clusters. These results presented here open up a route towards

the fabrication of efficient \*\*\*Si\*\*\* -based light-emitting devices.

L7 ANSWER 3 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 2005:1121577 CAPLUS  
DN 143:486930  
ED Entered STN: 19 Oct 2005  
TI Manufacture of double- \*\*\*grating\*\*\* metal oxide semiconductor transistor  
IN Zhang, Shengdong; Chen, Wenxin; Huang, Ru; Liu, Xiaoyan; Zhang, Xing; Han, Ruqi; Wang, Yangyuan  
PA Peking University, Peop. Rep. China  
SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 8 pp.  
CODEN: CNXXEV  
DT Patent  
LA Chinese  
IC ICM H01L029-78  
ICS H01L021-336  
CC 76-3 (Electric Phenomena)  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CN 1567595	A	20050119	CN 2003-137771	20030624
PRAI	CN 2003-137771		20030624		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	CN 1567595	ICM	H01L029-78
		ICS	H01L021-336
		IPCI	H01L0029-78 [ICM,7]; H01L0021-336 [ICS,7]
AB	The title double- ***grating*** metal oxide semiconductor (MOS) transistor comprises a ***silicon*** substrate, an insulating medium layer, a source/drain region, a channel region, ***grating*** medium layers, and ***grating*** electrodes. The channel region is a ***silicon*** wall fabricated on the insulating medium layer and vertical to the substrate. The ***grating*** medium layers and the ***grating*** electrodes are disposed along the length direction and sym. at the left and right sides above the channel region, and the ***grating*** electrodes disposed sym. at the two sides are self-aligned and elec.-insulated to each other. The invention has the advantages of no parasitic components and good prospect for application in high-speed low-power integrated circuit.		
ST	double ***grating*** metal oxide semiconductor transistor manuf		
IT	Polishing (chem.-mech.; manuf. of double- ***grating*** metal oxide semiconductor transistor)		
IT	Vapor deposition process (chem.; manuf. of double- ***grating*** metal oxide semiconductor transistor)		
IT	Corrosion Doping Etching Integrated circuits ***Ion*** ***implantation*** MOS transistors Photolithography Semiconductor device fabrication (manuf. of double- ***grating*** metal oxide semiconductor transistor)		
IT	7440-21-3, ***Silicon*** , processes RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses) (manuf. of double- ***grating*** metal oxide semiconductor transistor)		
IT	7631-86-9P, ***Silicon*** dioxide, processes 12033-89-5P, ***Silicon*** nitride, processes RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses) (manuf. of double- ***grating*** metal oxide semiconductor transistor)		
IT	7440-38-2, Arsenic, uses 7440-42-8, Boron, uses		

RL: MOA (Modifier or additive use); USES (Uses)  
 (manuf. of double- \*\*\*grating\*\*\* metal oxide semiconductor transistor)

IT 7664-38-2, Phosphoric acid, uses 7664-39-3D, Hydrogen fluoride, mixt. with ammonium fluoride 12125-01-8D, Ammonium fluoride, mixt. with hydrogen fluoride  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (manuf. of double- \*\*\*grating\*\*\* metal oxide semiconductor transistor)

L7 ANSWER 4 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2005:603450 CAPLUS  
 ED Entered STN: 13 Jul 2005  
 TI Submicrometer period \*\*\*silicon\*\*\* diffraction \*\*\*gratings\*\*\* by porous etching  
 AU Nagy, N.; Volk, J.; Hamori, A.; Barsony, I.  
 CS Research Institute for Technical Physics and Materials Science, MTA MFA, Budapest, 1525, Hung.  
 SO Physica Status Solidi A: Applications and Materials Science (2005), 202(8), 1639-1643  
 CODEN: PSSABA; ISSN: 0031-8965  
 PB Wiley-VCH Verlag GmbH & Co. KGaA  
 DT Journal  
 LA English  
 CC 74 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB We have developed a new technique to manuf. diffraction \*\*\*gratings\*\*\* on porous \*\*\*silicon\*\*\* and on \*\*\*silicon\*\*\* interface. Using holog. facilitate to adjust the periodic length of \*\*\*gratings\*\*\* in the submicron range. The holog. exposed and developed photoresist applied on the \*\*\*silicon\*\*\* surface provides the mask for the \*\*\*ion\*\*\* \*\*\*implantation\*\*\*. The sinusoidal \*\*\*grating\*\*\* between the substrate and the porous \*\*\*silicon\*\*\* layer is achieved after the anodic etch process. The PS layer can be removed by alkali etching. Sinusoidal one- and two-dimensional diffraction \*\*\*gratings\*\*\* have been produced with 375 nm periodic length. Their AFM images are shown. The diffraction efficiencies were measured.

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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 (10) Maiello, G; Thin Solid Films 1997, V297, P311 CAPLUS

L7 ANSWER 5 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2005:529273 CAPLUS  
 DN 143:295257  
 ED Entered STN: 20 Jun 2005  
 TI Producing method for distributed Bragg reflector semiconductor laser with tunable wavelength  
 IN Lu, Yu; Zhang, Jing; Zhu, Hongliang  
 PA Inst. of Semiconductors, CAS, Peop. Rep. China  
 SO Faming Zhuanli Shenqing Gongkai Shuomingshu, No pp. given  
 CODEN: CNXXEV  
 DT Patent  
 LA Chinese  
 IC ICM H01S005-00  
 CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI CN 1527447	A	20040908	CN 2003-106828	20030303
PRAI CN 2003-106828		20030303		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES



CN 1527447 ICM H01S005-00  
 IPCI H01S0005-00 [ICM,7]  
 AB The title method includes the following steps: (1) epitaxially growing multiple quantum well structures on N-type indium phosphide substrate, (2) growing SiN and \*\*\*silicon\*\*\* dioxide dielec. layer on the multiple quantum well layer, rapidly annealing, and photolithog., (3) selectively etching to eliminate InGaAs layer, indium phosphide layer and InGaAsP layer, (4) opening \*\*\*grating\*\*\* window in the indium phosphide layer by photolithog., maintaining indium phosphide layer on the active area, removing indium phosphide layer in the \*\*\*grating\*\*\* window, and producing uniform \*\*\*grating\*\*\* in large area, (5) selectively etching indium phosphide layer and epitaxially growing \*\*\*grating\*\*\* -covering layer and electrode contact layer, (6) forming single ridged strip and elec. isolating trench by photolithog., depositing SiO2 layer, and \*\*\*implanting\*\*\* \*\*\*ions\*\*\* in isolating slot to form high isolating resistance area, and (7) sputtering to form P electrode and N electrode.  
 ST tunable distributed bragg reflector semiconductor laser quantum well intermixing  
 IT Quantum well devices  
 (intermixing; producing method for distributed bragg reflector semiconductor laser with tunable wavelength)  
 IT Annealing  
 Bragg reflectors  
 Epitaxy  
 Etching  
 \*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
 Photolithography  
 Semiconductor lasers  
 Sputtering  
 (producing method for distributed bragg reflector semiconductor laser with tunable wavelength)  
 IT 7631-86-9, \*\*\*Silicon\*\*\* dioxide, uses 12033-89-5, \*\*\*Silicon\*\*\* nitride, uses 12645-36-2, Indium gallium arsenide phosphide 22398-80-7, Indium phosphide, uses 106070-25-1, Indium gallium arsenide  
 RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
 (producing method for distributed bragg reflector semiconductor laser with tunable wavelength)

L7 ANSWER 6 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2005:171345 CAPLUS  
 DN 142:327430  
 ED Entered STN: 01 Mar 2005  
 TI Bipolar junction-type \*\*\*grating\*\*\* transistor with high performance and its manufacture  
 IN Jin, Xiangliang; Chen, Jie; Qiu, Yulin  
 PA Microelectronics Center, Chinese Academy of Sciences, Peop. Rep. China  
 SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 12 pp.  
 CODEN: CNXXEV  
 DT Patent  
 LA Chinese  
 IC ICM H01L031-00  
 CC 76-3 (Electric Phenomena)  
 Section cross-reference(s): 74

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI CN 1459874	A	20031203	CN 2002-120354	20020523
PRAI CN 2002-120354		20020523		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
CN 1459874	ICM	H01L031-00
	IPCI	H01L0031-00 [ICM,7]

AB The \*\*\*grating\*\*\* transistor consists of a p-type \*\*\*Si\*\*\* substrate, a SiO2 layer grown epitaxially on the \*\*\*Si\*\*\* substrate, a metal layer on the SiO2 layer, and a p+n implanted junction on the \*\*\*Si\*\*\* substrate at one side of the MOS capacitor. The incoming light is converted on the SiO2 contact interface into signal charge that is stored in the potential well, and the signal charge is drift-read out under elec. field and it can be coupled with the charge (its polarity is

opposite to that of the signal charge) in the implanted junction to form composite current to be read out. The process involves thermal oxidn. of p-type \*\*\*Si\*\*\* substrate to form SiO2 film, photoetching to form pos. and neg. electrodes, and gate on the active region, field oxidizing, etching to form gate oxidn. opening, gate oxidizing, depositing poly-\*\*\*Si\*\*\* layer, photoetching the poly-\*\*\*Si\*\*\* gate, \*\*\*implanting\*\*\* and diffusing n+ \*\*\*ion\*\*\* in the neg. electrode region, \*\*\*implanting\*\*\* and diffusing n- \*\*\*ion\*\*\* in the pos. electrode region to form n- well, \*\*\*implanting\*\*\* and diffusing p+ \*\*\*ion\*\*\* in the n- well, depositing SiO2 film, etching to form electrode contact opening, Al depositing, etching to form Al electrode, depositing to form a surface passivated film, and etching to form a bonding layer.

ST bipolar junction transistor \*\*\*silicon\*\*\* silica aluminum MOS capacitor photoetching; metal oxide semiconductor capacitor bipolar junction \*\*\*grating\*\*\* transistor

IT Bipolar transistors  
Diffusion  
Electric field  
Etching  
Gate contacts  
\*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
MOS capacitors  
Oxidation  
Polarity  
Potential well  
Semiconductor junctions  
(high-performance bipolar junction-type \*\*\*grating\*\*\* transistor manuf.)

IT Etching  
(photochem.; high-performance bipolar junction-type \*\*\*grating\*\*\* transistor manuf.)

IT 7429-90-5, Aluminum, uses 7440-21-3, \*\*\*Silicon\*\*\* , uses 7631-86-9, Silica, uses  
RL: DEV (Device component use); USES (Uses)  
(high-performance bipolar junction-type \*\*\*grating\*\*\* transistor manuf.)

L7 ANSWER 7 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 2004:914765 CAPLUS  
DN 142:188093  
ED Entered STN: 02 Nov 2004  
TI Method for forming shallow junction of semiconductor device  
IN Oh, Chung Yeong  
PA Anam Semiconductor., Ltd., S. Korea  
SO Repub. Korean Kongkae Taeho Kongbo, No pp. given  
CODEN: KRXXA7  
DT Patent  
LA Korean  
IC ICM H01L021-336  
CC 76-3 (Electric Phenomena)  
Section cross-reference(s): 48

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI KR 2001087474	A	20010921	KR 1999-68498	19991231
PRAI KR 1999-68498		19991231		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
KR 2001087474	ICM	H01L021-336
	IPCI	H01L0021-336 [ICM,7]

AB A method for forming a shallow junction of a semiconductor device is provided to prevent diffusion of B ions by performing a spike thermal process. A field oxide layer is formed on a field region of a semiconductor substrate. A gate oxide layer is formed on the semiconductor substrate. A gate is formed by depositing and etching a polysilicon layer on the gate oxide layer. An insulating layer spacer is formed at a side of the gate. A photoresist layer is applied on the substrate. A photoresist layer pattern is formed by patterning the photoresist layer. A drain/source region having a shallow junction is formed by \*\*\*implanting\*\*\* B \*\*\*ions\*\*\*. A C region is formed on

the drain/source region by \*\*\*implanting\*\*\* C \*\*\*ions\*\*\* . A spike thermal process was performed to activate B, recover a damage of a \*\*\*grating\*\*\* , and prevent a diffusion of the B ions.

ST forming shallow junction semiconductor device

IT Diffusion  
Doping  
Etching  
Photolithography  
(fabrication step; forming shallow junction of semiconductor device)

IT Semiconductor device fabrication  
(forming shallow junction of semiconductor device)

IT 7440-21-3, \*\*\*Silicon\*\*\* , processes  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(device component; forming shallow junction of semiconductor device)

IT 7440-42-8D, Boron, \*\*\*ions\*\*\* , processes 7440-44-0D, Carbon, \*\*\*ions\*\*\* , processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(fabrication step, \*\*\*implantation\*\*\* ; forming shallow junction of semiconductor device)

L7 ANSWER 8 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2004:748399 CAPLUS

DN 143:86545

ED Entered STN: 14 Sep 2004

TI Spontaneously generated sinusoidal-like structures on Ti-Ni thin film under focused \*\*\*ion\*\*\* -beam \*\*\*bombardment\*\*\*

AU Fu, Yongqi; Bryan, Ngoi Kok Ann

CS Innovation in Manufacturing Systems and Technology, Singapore-Massachusetts Institute of Technology Alliance, 639798, Singapore

SO Optics Express (2004), 12(16), 3707-3712  
CODEN: OPEXFF; ISSN: 1094-4087  
URL: [http://www.opticsexpress.org/view\\_file.cfm?doc=%24%29%3C7%2EKP%20%20%0A&id=%24%2A%2CO%2FJ%20%20%20%0A](http://www.opticsexpress.org/view_file.cfm?doc=%24%29%3C7%2EKP%20%20%0A&id=%24%2A%2CO%2FJ%20%20%20%0A)

PB Optical Society of America

DT Journal; (online computer file)

LA English

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
Section cross-reference(s): 73

AB A new fabrication method for a sinusoidal-like structure is described. The sinusoidal structure can be spontaneously self-formed on the surface of a substrate by focused \*\*\*ion\*\*\* -beam \*\*\*bombardment\*\*\* with raster scanning and an \*\*\*ion\*\*\* incident angle perpendicular to the sample surface (normal incidence). The substrate material is a \*\*\*silicon\*\*\* wafer coated with 2-.mu.m-thick Ti-Ni thin film. The authors show by measurement and anal. of the \*\*\*grating\*\*\* characteristics at the working wavelength range from 50 to 1500 nm that the technique of self-organized formation is a valid approach for microfabrication of diffractive structures, and the spontaneously generated structure under \*\*\*ion\*\*\* \*\*\*bombardment\*\*\* is applicable for a sinusoidal \*\*\*grating\*\*\* that functions from the UV to the near-IR wavelength range.

ST diffractive sinusoidal structure fabrication \*\*\*ion\*\*\* beam  
\*\*\*bombardment\*\*\* titanium nitride

IT Machining  
(ion-beam milling; spontaneously generated sinusoidal-like structures on Ti-Ni thin film under focused \*\*\*ion\*\*\* -beam \*\*\*bombardment\*\*\* )

IT Diffraction \*\*\*gratings\*\*\*  
(spontaneously generated sinusoidal-like structures on Ti-Ni thin film under focused \*\*\*ion\*\*\* -beam \*\*\*bombardment\*\*\* )

IT 25583-20-4, Titanium nitride  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(spontaneously generated sinusoidal-like structures on Ti-Ni thin film under focused \*\*\*ion\*\*\* -beam \*\*\*bombardment\*\*\* )

IT 15091-79-9, Gallium(1+), processes  
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)  
(spontaneously generated sinusoidal-like structures on Ti-Ni thin film

under focused \*\*\*ion\*\*\* -beam \*\*\*bombardment\*\*\* )

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (2) Fu, Y; Opt Express, <http://www.opticsexpress.org> 2004, V12, P227 CAPLUS
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- (7) Kim, D; Appl Phys Lett 1995, V66, P1166 CAPLUS
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- (9) Rochon, P; Appl Phys Lett 1995, V66, P136 CAPLUS

L7 ANSWER 9 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2004:424966 CAPLUS

DN 141:357141

ED Entered STN: 26 May 2004

TI Structure and optical properties of sol-gel derived Gd<sub>2</sub>O<sub>3</sub> waveguide films

AU Guo, Hai; Yang, Xudong; Xiao, Teng; Zhang, Weiping; Lou, Liren; Mugnier, Jacques

CS University of Science and Technology of China, Structure Research Laboratory, Academia Sinica, Hefei, Anhui, 230026, Peop. Rep. China

SO Applied Surface Science (2004), 230(1-4), 215-221

CODEN: ASUSEE; ISSN: 0169-4332

PB Elsevier Science B.V.

DT Journal

LA English

CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB Pure and rare earth doped Gd oxide (Gd<sub>2</sub>O<sub>3</sub>) waveguide films were prepd. by a simple sol-gel process and dip-coating method. Gd<sub>2</sub>O<sub>3</sub> was successfully synthesized by hydrolysis of Gd acetate. TGA and DTA were used to study the thermal chem. properties of dried gel. Structure of Gd<sub>2</sub>O<sub>3</sub> films annealed at different temp. ranging from 400 to 750.degree. were studied by FTIR spectroscopy, XRD and TEM. Gd<sub>2</sub>O<sub>3</sub> starts crystg. at .apprx.400.degree. and the crystallite size increases with annealing temp. Oriented growth of (4 0 0) face of Gd<sub>2</sub>O<sub>3</sub> was obsd. when the films were deposited on (1 0 0) \*\*\*Si\*\*\* substrate and annealed at 750.degree.. The laser beam (.lambda.=632.8 nm) was coupled into the film by a prism \*\*\*coupler\*\*\* and propagation loss of the film measured by scattering-detection method is .apprx.2 dB/cm. Luminescence properties of Eu \*\*\*ions\*\*\* \*\*\*doped\*\*\* films were measured and are discussed.

ST structure optical property sol gel gadolinium oxide waveguide film; europium doped gadolinium oxide photoluminescence

IT IR spectra

Luminescence

Sol-gel processing

Surface structure

X-ray diffraction

(structure and optical properties of sol-gel derived Gd<sub>2</sub>O<sub>3</sub> waveguide films)

IT 7440-53-1, Europium, properties

RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)

(dopant, for Gd<sub>2</sub>O<sub>3</sub>; structure and optical properties of sol-gel derived Gd<sub>2</sub>O<sub>3</sub> waveguide films)

IT 12064-62-9P, Gadolinium oxide (Gd<sub>2</sub>O<sub>3</sub>)

RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation) (doped with Eu; structure and optical properties of sol-gel derived Gd<sub>2</sub>O<sub>3</sub> waveguide films)

IT 32718-54-0, Methoxyethanol

RL: NUU (Other use, unclassified); USES (Uses)

(in GdO sol-gel processing; structure and optical properties of sol-gel derived GdO waveguide films)

IT 111-40-0, Diethylenetriamine

RL: NUU (Other use, unclassified); USES (Uses)

(in Gd<sub>2</sub>O<sub>3</sub> sol-gel processing; structure and optical properties of sol-gel derived Gd<sub>2</sub>O<sub>3</sub> waveguide films)

IT 16056-77-2, Gadolinium acetate

RL: RCT (Reactant); RACT (Reactant or reagent)

(structure and optical properties of sol-gel derived Gd<sub>2</sub>O<sub>3</sub> waveguide films)

IT 7440-21-3, \*\*\*Silicon\*\*\* , uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(substrate; structure and optical properties of sol-gel derived Gd2O3  
waveguide films)

RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L7 ANSWER 10 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2004:329729 CAPLUS

DN 142:122899

ED Entered STN: 23 Apr 2004

TI Self-organized formation of a blazed- \*\*\*grating\*\*\* -like structure  
induced by focused ion-beam scanning

AU Fu, Yongqi; Bryan, Ngoi Kok Ann; Zhou, Wei

CS Innovation in Manufacturing Systems and Technology, Singapore-  
Massachusetts Institute of Technology Alliance, 639798, Singapore

SO Optics Express (2004), 12(2), 227-233

CODEN: OPEXFF; ISSN: 1094-4087

URL: [http://www.opticsexpress.org/view\\_file.cfm?doc=%24%28L%23%2BI%40%20%20%0A&id=%24%29L%2F%28J%20%20%20%0A](http://www.opticsexpress.org/view_file.cfm?doc=%24%28L%23%2BI%40%20%20%0A&id=%24%29L%2F%28J%20%20%20%0A)

PB Optical Society of America

DT Journal; (online computer file)

LA English

CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other  
Reprographic Processes)

AB A new one-step method, which has been named self-organized formation, for  
microfabrication of blazed- \*\*\*grating\*\*\* -like structures after  
\*\*\*bombardment\*\*\* with a focused \*\*\*ion\*\*\* beam (FIB) with an ion  
energy of 50 keV and a beam current of 0.5 nA is presented. The structure  
is fabricated by the FIB by raster scanning (not by patterned scanning)  
upon a substrate of a \*\*\*silicon\*\*\* wafer, \*\*\*Si\*\*\* (100), with  
total scanning time of 14 min. With this method the parameters are  
unchanged during the whole process, unlike for the point-by-point direct  
writing technique, in which the exposure intensity or the electron- or  
ion-beam dose is changed for each point. The surface roughness of the  
structure, Ra, is 2.5 nm over an area of 1 .mu.m .times. 1 .mu.m. To  
evaluate the performance of this method we carried out a simulation, using  
the PCGrate program. The simulated diffraction efficiency, of diffraction  
order -3 working in the reflection mode, can be as much as 79.1% for the  
violet wavelength of 400 nm. Using a He-Ne laser as the light source  
produced a measured diffraction efficiency of the order of -2 of 70.4%,  
which is near the simulated value of 76.9% at a wavelength of 600 nm. The  
depth and the period of the structure can be controlled by process  
parameters of the FIB, such as ion energy and ion flux.

ST selforganized \*\*\*silicon\*\*\* blazed \*\*\*grating\*\*\* structure  
\*\*\*ion\*\*\* beam \*\*\*bombardment\*\*\*

IT \*\*\*Ion\*\*\* \*\*\*bombardment\*\*\*

Microstructure

Optical diffraction

Surface roughness  
 (self-organized formation of blazed- \*\*\*grating\*\*\* -like structure induced by focused ion-beam scanning)

IT 7440-21-3, \*\*\*Silicon\*\*\*, properties  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)  
 (self-organized formation of blazed- \*\*\*grating\*\*\* -like structure induced by focused ion-beam scanning)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE  
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L7 ANSWER 11 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2004:306181 CAPLUS  
 DN 140:313456  
 ED Entered STN: 15 Apr 2004  
 TI Method for forming cantilever beam model micro-electromechanical system  
 IN Chen, Anchor; Hong, Gary  
 PA United Microelectronics Corp., Taiwan  
 SO U.S., 18 pp.  
 CODEN: USXXAM  
 DT Patent  
 LA English  
 IC ICM H01L021-311  
 INCL 438694000; 438048000; 438052000; 438053000  
 CC 76-3 (Electric Phenomena)  
 Section cross-reference(s): 73

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6720267	B1	20040413	US 2003-249149	20030319
CN 1532137	A	20040929	CN 2004-10006410	20040227
PRAI US 2003-249149	A	20030319		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 6720267	ICM	H01L021-311
	INCL	438694000; 438048000; 438052000; 438053000
	IPCI	H01L0021-311 [ICM,7]
	NCL	438/694.000; 438/048.000; 438/052.000; 438/053.000
CN 1532137	IPCI	B81C0001-00 [ICM,7]

AB A cantilever beam-type micro-electromech. system (MEMS) is formed on a substrate. Two first electrodes are formed in a first dielec. layer on the substrate and a waveguide line is formed between the first electrodes. A patterned sacrificial layer and an arm layer are formed on the substrate. Two second electrodes and a second dielec. layer are formed in the arm layer, and an optical \*\*\*grating\*\*\* is formed in the second dielec. layer. Finally, a cap layer is formed on the substrate, and the patterned sacrificial layer is removed. The cantilever beam-type MEMS can be applied in the field of fiber-optic fiber-optic communication.

ST cantilever beam model microelectromech system; MEMS cantilever beam type; fiber optic communication cantilever beam type MEMS

IT Polishing  
 (chem.-mech.; formation of cantilever beam model micro-electromech. system for)

IT Vapor deposition process  
 (chem.; formation of cantilever beam model micro-electromech. system for)

IT Cantilevers (components)  
 Dielectric films  
 Diffraction \*\*\*gratings\*\*\*

Electric insulators  
Waveguides  
(formation of cantilever beam model micro-electromech. system)

IT Electric conductors  
Epitaxy  
Etching  
Fiber optics  
\*\*\*Ion\*\*\*      \*\*\*implantation\*\*\*  
Optical communication  
Optical filters  
Photoresists  
Rapid thermal annealing  
Refractive index  
\*\*\*SOI\*\*\* devices  
(formation of cantilever beam model micro-electromech. system for)

IT Polymers, uses  
RL: DEV (Device component use); USES (Uses)  
(formation of cantilever beam model micro-electromech. system for)

IT Micromachines  
(microelectromech. devices; formation of cantilever beam model  
micro-electromech. system)

IT Semiconductor materials  
(substrate; formation of cantilever beam model micro-electromech.  
system for)

IT 7429-90-5, Aluminum, uses 7440-33-7, Tungsten, uses 7440-50-8, Copper,  
uses 7440-57-5, Gold, uses 7631-86-9, Silica, uses 12033-89-5,  
\*\*\*Silicon\*\*\* nitride, uses 65442-43-5, Aluminum alloy, Al, Cu  
RL: DEV (Device component use); USES (Uses)  
(formation of cantilever beam model micro-electromech. system for)

IT 7723-14-0, Phosphorus, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(formation of cantilever beam model micro-electromech. system for)

IT 7440-21-3, \*\*\*Silicon\*\*\*, uses  
RL: DEV (Device component use); USES (Uses)  
(polycryst. or porous; formation of cantilever beam model  
micro-electromech. system for)

RE.CNT 2      THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE  
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L7 ANSWER 12 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 2004:278422 CAPLUS  
DN 141:286456  
ED Entered STN: 05 Apr 2004  
TI Fabrication and thermal annealing behavior of nanoscale ripple fabricated  
by focused ion beam  
AU Xie, D. Z.; Ngoi, B. K. A.; Zhou, W.; Fu, Y. Q.  
CS School of Mechanical and Production Engineering, Precision Engineering and  
Nanotechnology Center, Nanyang Technological University, Singapore,  
639798, Singapore  
SO Applied Surface Science (2004), 227(1-4), 250-254  
CODEN: ASUSEE; ISSN: 0169-4332  
PB Elsevier Science B.V.  
DT Journal  
LA English  
CC 76-2 (Electric Phenomena)  
Section cross-reference(s): 66  
AB The development, during annealing, of periodic 1-dimensional ripple  
structure was studied. The nanoscale ripple array was fabricated on  
\*\*\*Si\*\*\* (0 0 1) crystal surface using focused ion beam (FIB). Annealing  
was performed isothermally in a flowing Ar gas ambient at 670.degree..  
The morphol. of the ripple before and after annealing was analyzed using  
at. force microscope. The height of the ripple decreased after thermal  
annealing. Also, after annealing, spikes of Ga and/or Ga-rich ppt. were  
also obsd. on the surface of the ripples and the FIB milled areas.

ST \*\*\*silicon\*\*\* nanoripple gallium focused \*\*\*ion\*\*\*  
\*\*\*bombardment\*\*\* annealing

IT Flow  
(argon; fabrication and thermal annealing behavior of nanoscale ripple  
fabricated by focused ion beam of gallium on \*\*\*silicon\*\*\* )

IT Annealing

Diffraction \*\*\*gratings\*\*\*  
 \*\*\*Ion\*\*\* \*\*\*bombardment\*\*\*  
 Precipitation (chemical)  
 Semiconductor nanostructures  
 Surface roughness  
 (fabrication and thermal annealing behavior of nanoscale ripple  
 fabricated by focused ion beam of gallium on \*\*\*silicon\*\*\* )  
 IT 15091-79-9, Gallium(1+), processes  
 RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical  
 process); PYP (Physical process); PROC (Process); USES (Uses)  
 (fabrication and thermal annealing behavior of nanoscale ripple  
 fabricated by focused ion beam of gallium on \*\*\*silicon\*\*\* )  
 IT 7440-21-3, \*\*\*Silicon\*\*\* , properties  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP  
 (Physical process); TEM (Technical or engineered material use); PROC  
 (Process); USES (Uses)  
 (fabrication and thermal annealing behavior of nanoscale ripple  
 fabricated by focused ion beam of gallium on \*\*\*silicon\*\*\* )  
 IT 7440-37-1, Argon, processes  
 RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical  
 process); PYP (Physical process); PROC (Process); USES (Uses)  
 (flowing annealing gas; fabrication and thermal annealing behavior of  
 nanoscale ripple fabricated by focused ion beam of gallium on  
 \*\*\*silicon\*\*\* )  
 RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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 L7 ANSWER 13 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2003:913801 CAPLUS  
 DN 141:31997  
 ED Entered STN: 23 Nov 2003  
 TI Micro cantilevers with integrated heaters and piezoelectric detectors for  
 low power SPM data storage application  
 AU Lee, Caroline Sunyong; Jin, Won-Hyeog; Nam, Hyo-Jin; Cho, Seong-Moon; Kim,  
 Young-Sik; Bu, Jong-uk  
 CS Micro system Group, Device & Materials Lab., LG Electronics Institute of  
 Technology, Seoul, S. Korea  
 SO Proceedings - IEEE Annual International Conference on Micro Electro  
 Mechanical Systems, 16th, Kyoto, Japan, Jan. 19-23, 2003 (2003), 28-32  
 Publisher: Institute of Electrical and Electronics Engineers, New York, N.  
 Y.  
 CODEN: 69ETSU; ISBN: 0-7803-7744-3  
 DT Conference  
 LA English  
 CC 76-7 (Electric Phenomena)  
 Section cross-reference(s): 48, 74  
 AB In this research, \*\*\*Si\*\*\* cantilevers with integrated heaters and  
 piezoelec. sensors were studied for thermomech. writing and piezoelec.  
 readback on a polymer film, for low power SPM (Scanning Probe Microscopy)  
 data storage system. Data bits of 100 nm in diam. were recorded on a Poly  
 Me Methacrylate (PMMA) film. The sensitivity of 0.22 fC/nm was obtained.



Finally, the \*\*\*Si\*\*\* cantilever with piezoelec. sensor was used to obtain charge readback signal using the \*\*\*grating\*\*\* with 30 nm depth, and the sensing ability of the piezoelec. cantilever was successfully demonstrated. The charge output based on the topog. of the film was obtained, and the pos. and neg. peak of the charge corresponded to the slope of the \*\*\*grating\*\*\*.

ST fabrication \*\*\*silicon\*\*\* cantilever PZT piezoelec sensor SPM recording

IT Etching  
(anisotropic; in fabrication of micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT Vapor deposition process  
(chem.; in fabrication of micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT Sol-gel processing  
(coating; in fabrication of micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT Electric heaters  
(elements; micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT Sputtering  
(etching, reactive; in fabrication of micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT Electronic device fabrication  
(fabrication of micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT Annealing  
\*\*\*Ion\*\*\* \*\*\*implantation\*\*\*

Passivation

Rapid thermal annealing  
(in fabrication of micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT \*\*\*SOI\*\*\* devices  
(in micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT Cantilevers (components)

Piezoelectric sensors

Recording

Scanning probe microscopy  
(micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT Coating process  
(sol-gel; in fabrication of micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT Etching  
(sputter, reactive; in fabrication of micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT 7727-37-9, Nitrogen, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(annealing atm.; in fabrication of micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT 9011-14-7, Poly methyl Methacrylate  
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(data-storage medium; micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT 1310-58-3, Potassium hydroxide (KOH), processes  
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(etchant; in fabrication of micro cantilevers with integrated heaters

and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT 7440-06-4, Platinum, processes 7440-32-6, Titanium, processes  
12036-10-1, Ruthenium oxide (RuO2) 12626-81-2, PZT  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(in fabrication of micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT 7631-86-9, Silica, processes  
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(in micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT 7440-21-3, \*\*\*Silicon\*\*\*, processes  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(in micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

IT 7440-42-8, Boron, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
( \*\*\*silicon\*\*\* dopant; in fabrication of micro cantilevers with integrated heaters and piezoelec. detectors for low power scanning probe microscopy data storage application)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L7 ANSWER 14 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2003:913656 CAPLUS

DN 141:30691

ED Entered STN: 23 Nov 2003

TI Unique nonlinear optical and electronic properties of SiC:Ge waveguide for device applications

AU Darwish, Abdalla M.; Koplitz, Brent D.; Kukhtarev, Nicholai V.; Mitchell, Oliva; Haydel, R.; Gomlak, G.; Combs, R.

CS Physics and Engineering Department, Dillard University, New Orleans, LA, 70122, USA

SO Proceedings of SPIE-The International Society for Optical Engineering (2003), 5206(Photorefractive Fiber and Crystal Devices: Materials, Optical Properties, and Applications IX), 166-176

CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB Using a combination of \*\*\*ion\*\*\* \*\*\*implantation\*\*\* and laser ablation techniques, a waveguide of \*\*\*ion\*\*\* \*\*\*implanted\*\*\* SiC:Ga:Ge was fabricated and was used as a CO2 laser line selector. It was obsd. that the CO2 laser produces a thermal \*\*\*grating\*\*\* which drives the optical selector with max. efficiency of 40 MHz of laser offset between the 9P20 and 9P18 CO2 laser lines. Using an external elec. field, the moving thermal \*\*\*grating\*\*\* produces a 45 MHz offset between the laser lines. This phenomenon will be explained using the Kukhtarev model. The threshold of the thermal damage for the waveguide and the device limiting will be presented.

ST \*\*\*silicon\*\*\* carbide germanium gallium waveguide nonlinear optical property

IT Diffraction \*\*\*gratings\*\*\*  
 (reflection; unique nonlinear optical and electronic properties of  
 \*\*\*silicon\*\*\* carbide:germanium waveguide for device applications)

IT Diffusion  
 Stress, mechanical  
 (thermal; unique nonlinear optical and electronic properties of  
 \*\*\*silicon\*\*\* carbide:germanium waveguide for device applications)

IT Elastic deformation  
 Gas lasers  
 \*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
 Laser ablation  
 Nonlinear optical properties  
 Photorefractive effect  
 Surface roughness  
 Ultrathin films  
 Waveguides  
 (unique nonlinear optical and electronic properties of \*\*\*silicon\*\*\*  
 carbide:germanium waveguide for device applications)

IT 409-21-2, \*\*\*Silicon\*\*\* carbide, uses  
 RL: DEV (Device component use); USES (Uses)  
 (germanium and gallium-doped; unique nonlinear optical and electronic  
 properties of \*\*\*silicon\*\*\* carbide:germanium waveguide for device  
 applications)

IT 7440-55-3, Gallium, uses 7440-56-4, Germanium, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 ( \*\*\*silicon\*\*\* carbide doped with; unique nonlinear optical and  
 electronic properties of \*\*\*silicon\*\*\* carbide:germanium waveguide  
 for device applications)

IT 124-38-9, Carbon dioxide, uses  
 RL: DEV (Device component use); USES (Uses)  
 (unique nonlinear optical and electronic properties of \*\*\*silicon\*\*\*  
 carbide:germanium waveguide for device applications)

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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 Applications 1996, V397 CAPLUS
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L7 ANSWER 15 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2003:874745 CAPLUS

DN 139:343334

ED Entered STN: 07 Nov 2003

TI Integrated waveguide \*\*\*gratings\*\*\* by \*\*\*ion\*\*\*  
 \*\*\*implantation\*\*\*

IN Goldstein, Michael

PA Intel Corp., USA

SO U.S. Pat. Appl. Publ., 9 pp.

CODEN: USXXCO

DT Patent

LA English

IC ICM G02B006-12

ICS G02B006-34

INCL 385037000; 385014000

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003206698	A1	20031106	US 2002-136154	20020501
	US 6816648	B2	20041109		
PRAT	US 2002-136154		20020501		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	US 2003206698	ICM	G02B006-12
		ICS	G02B006-34
		INCL	385037000; 385014000
		IPCI	G02B0006-12 [ICM,7]; G02B0006-34 [ICS,7]
		NCL	385/037.000
		ECLA	G02B006/124; G02B006/132; G02B006/134J; G02B006/136
AB	Integrated semiconductor waveguide ***gratings***, methods of manuf. thereof and methods of apodizing thereof are described. A semiconductor waveguide ***grating*** includes a substrate, a cladding layer disposed on the substrate, a guide structure that includes a plurality of discrete transverse sections ***implanted*** with ***ions*** disposed between adjacent transverse sections substantially free of ***implanted*** ***ions***.		
ST	integrated waveguide	***grating***	***ion*** ***implantation***
IT	Diffraction	***gratings***	***Ion*** ***implantation***
	Optical waveguides (integrated waveguide ***gratings*** by ***ion*** ***implantation***)		
IT	7440-21-3,	***Silicon***	, uses 22398-80-7, Indium phosphide, uses
	RL: DEV (Device component use); USES (Uses)		
	(integrated waveguide	***gratings***	by ***ion*** ***implantation***)
IT	7440-42-8, Boron, uses		
	RL: MOA (Modifier or additive use); USES (Uses)		
	(integrated waveguide	***gratings***	by ***ion*** ***implantation***)

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L7 ANSWER 16 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2003:785519 CAPLUS  
 DN 140:11150  
 ED Entered STN: 08 Oct 2003  
 TI Dose dependence of carrier and heat dynamics at an \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* surface measured using lens-free  
 heterodyne transient \*\*\*grating\*\*\* method  
 AU Katayama, Kenji; Yamaguchi, Masahiro; Sawada, Tsuguo  
 CS Graduate School of Frontier Sciences, Department of Advanced Materials  
 Science 401, The University of Tokyo, Kashiwa, Chiba, 277-8561, Japan  
 SO Journal of Applied Physics (2003), 94(8), 4904-4907  
 CODEN: JAPIAU; ISSN: 0021-8979  
 PB American Institute of Physics  
 DT Journal  
 LA English  
 CC 76-3 (Electric Phenomena)  
 AB The lens-free heterodyne transient \*\*\*grating\*\*\* method was shown to  
 reveal the dynamics of photoexcited carriers and heat on the surface  
 region of an \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* in the  
 dose range of 1011-1015 cm<sup>-2</sup>. In addn. to the fact that the detection  
 limit of the dose was superior to that for conventional methods, several  
 phys. properties of the carrier and heat can be obtained by analyzing  
 transient responses. Theor. anal. provided the lifetime of carriers and  
 thermal diffusion coeffs. in the \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* surface  
 region.  
 ST photoexcited carrier surface dynamics \*\*\*silicon\*\*\* \*\*\*ion\*\*\*  
 \*\*\*implantation\*\*\*  
 IT Electric current carriers  
 \*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
 Optical pumping  
 Photoexcitation  
 Semiconductor materials  
 (dose dependence of carrier and heat dynamics at \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* surface measured by lens-free  
 heterodyne transient \*\*\*grating\*\*\* method)  
 IT Electric current carriers  
 (lifetime; dose dependence of carrier and heat dynamics at \*\*\*ion\*\*\*  
 - \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* surface measured by lens-free  
 heterodyne transient \*\*\*grating\*\*\* method)  
 IT 7440-21-3, \*\*\*Silicon\*\*\*, properties  
 RL: PRP (Properties); TEM (Technical or engineered material use); USES  
 (Uses)  
 (dose dependence of carrier and heat dynamics at \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* surface measured by lens-free  
 heterodyne transient \*\*\*grating\*\*\* method)

RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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L7 ANSWER 17 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 2003:623705 CAPLUS  
DN 140:49934  
ED Entered STN: 14 Aug 2003  
TI Angled- \*\*\*grating\*\*\* and photonic-crystal type-II antimonide lasers  
for high-brightness applications  
AU Bewley, W. W.; Vurgaftman, I.; Felix, C. L.; Bartolo, R. E.; Lindle, J.  
R.; Jurkovic, M. J.; Meyer, J. R.; Turner, G. W.; Manfra, M. J.; Lee, H.;  
Martinelli, R. U.  
CS Naval Research Laboratory, Washington, DC, 20375, USA  
SO IPAP Conference Series (2001), 2(Proceedings of the 10th International  
Conference on Narrow Gap Semiconductors and Related Small Energy  
Phenomena, Physics and Applications, 2001), 125-128  
CODEN: ICSPF6  
PB Institute of Pure and Applied Physics  
DT Journal  
LA English  
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related  
Properties)  
AB Angled- \*\*\*grating\*\*\* distributed-feedback (.alpha.-DFB) and  
photonic-crystal DFB (PCDFB) lasers emitting in the mid-IR are promising  
sources for applications requiring a combination of high output power and  
good beam quality. We demonstrate that the beam quality and brightness of  
wide-stripe .alpha.-DFB lasers can be significantly enhanced by  
suppressing parasitic Fabry-Perot-like lasing modes that are not  
appreciably guided by the angled \*\*\*grating\*\*\*. A factor of 3  
increase in brightness is demonstrated by using loss regions, created by  
\*\*\*bombardment\*\*\* with energetic \*\*\*silicon\*\*\* \*\*\*ions\*\*\*, to  
block the direct facet-to-facet gain path. Furthermore, it is shown that  
the beam quality of PCDFB lasers, in which a \*\*\*grating\*\*\* is defined  
on a two-dimensional lattice, can be improved over .alpha.-DFB devices by  
as much as a factor of 5.  
ST angled \*\*\*grating\*\*\* photonic crystal antimonide laser high brightness  
IT Lasers  
(angled- \*\*\*grating\*\*\* and photonic-crystal type-II antimonide  
lasers for high-brightness applications)  
RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE  
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L7 ANSWER 18 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 2003:582991 CAPLUS  
DN 139:124868  
ED Entered STN: 30 Jul 2003  
TI Optical functional devices and manufacture  
IN Murai, Akihiko  
PA Matsushita Electric Works, Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
IC ICM G02B006-12  
ICS G02B006-13  
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003215361	A2	20030730	JP 2002-12140	20020121
PRAM	JP 2002-12140		20020121		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	JP 2003215361	ICM	G02B006-12
		ICS	G02B006-13
		IPCI	G02B0006-12 [ICM,7]; G02B0006-13 [ICS,7]
AB	The devices comprise: a ***Si*** substrate; photodiodes for receiving the light passing through a photonic crystal and reflecting at the ***grating***, where the photonic crystal comprises a three dimensionally interleaving nanomolithic ***silicon*** and silica crystals; and the ***grating*** comprises numerous silica crystals interleaving at wavelength distances.		
ST	***silicon*** silica optical functional diffraction lattice		
IT	Absorbents Diffraction ***gratings*** ***Ion*** ***implantation*** Lithography Nanocrystals Periodic structures Photodiodes Photonic crystals Radiation Strength (optical functional device and manuf.)		
IT	7440-21-3, ***Silicon***, uses 7631-86-9, Silica, uses RL: DEV (Device component use); USES (Uses) (optical functional device and manuf.)		

L7 ANSWER 19 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2003:457399 CAPLUS

DN 140:171112

ED Entered STN: 16 Jun 2003

TI Strong blue light emission from \*\*\*ion\*\*\* \*\*\*implanted\*\*\*  
\*\*\*Si\*\*\* /SiO2 structures

AU Skorupa, W.; Rebohle, L.; Gebel, T.; Helm, M.

CS Nanoparc GmbH, Dresden, D-01454, Germany

SO NATO Science Series, II: Mathematics, Physics and Chemistry (2003),  
93(Towards the First Silicon Laser), 69-78

CODEN: NSSICD

PB Kluwer Academic Publishers

DT Journal; General Review

LA English

CC 73-0 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 76

AB A review. A summary of the work performed in the prodn. of nanoclusters in \*\*\*silicon\*\*\* dioxide layers enriched with \*\*\*Si\*\*\*, Ge and Sn by ion beam synthesis for \*\*\*silicon\*\*\* based light emission is presented. Blue-light emission was demonstrated based on Ge-implanted \*\*\*silicon\*\*\* dioxide layers thermally grown on \*\*\*silicon\*\*\* substrates. This version of \*\*\*silicon\*\*\* -based light emission relies on Ge-related defects in the amorphous .tplbond. \*\*\*Si\*\*\* -O- \*\*\*Si\*\*\* .tplbond. network. The photoluminescence is excited by a singlet S0-S1 transition of a neutral oxygen vacancy.

ST review luminescence electroluminescence \*\*\*silicon\*\*\* silica nanocluster

IT Trapping

(charge; electroluminescence of \*\*\*ion\*\*\* \*\*\*implanted\*\*\*  
\*\*\*Si\*\*\* /SiO2 structures in relation to)

IT Optical \*\*\*couplers\*\*\*  
 ( \*\*\*ion\*\*\* \*\*\*implanted\*\*\* \*\*\*Si\*\*\* /SiO2 structures for)

IT Luminescence, electroluminescence  
 (of \*\*\*ion\*\*\* \*\*\*implanted\*\*\* \*\*\*Si\*\*\* /SiO2 structures)

IT Defects in solids  
 Luminescence  
 (strong blue luminescence from \*\*\*ion\*\*\* \*\*\*implanted\*\*\*  
 \*\*\*Si\*\*\* /SiO2 structures in relation to)

IT 7440-31-5, Tin, properties 7440-56-4, Germanium, properties  
 RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
 (strong blue luminescence from \*\*\*ion\*\*\* \*\*\*implanted\*\*\*  
 \*\*\*Si\*\*\* /SiO2 structures)

IT 7440-21-3, \*\*\*Silicon\*\*\*, properties 7631-86-9, \*\*\*Silicon\*\*\*  
 dioxide, properties  
 RL: PRP (Properties)  
 (strong blue luminescence from \*\*\*ion\*\*\* \*\*\*implanted\*\*\*  
 \*\*\*Si\*\*\* /SiO2 structures)

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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(1) Gebel, T; Appl Phys Lett (to appear on Sept 30) 2002  
 (2) Gebel, T; Dissertation, Technische Universitat Dresden 2002  
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 IEEE-98EX144, P827

L7 ANSWER 20 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2003:50450 CAPLUS  
 DN 138:295444  
 ED Entered STN: 22 Jan 2003

TI Transient reflecting \*\*\*grating\*\*\* spectroscopy for defect analysis in  
 surface region of semiconductors

AU Katayama, Kenji; Donen, Hiroshi; Sawada, Tsuguo  
 CS Graduate School of Frontier Science, Department of Advanced Materials  
 Science, The University of Tokyo, Tokyo, 113-8656, Japan  
 SO Review of Scientific Instruments (2003), 74(1, Pt. 2), 902-904  
 CODEN: RSINAK; ISSN: 0034-6748  
 PB American Institute of Physics  
 DT Journal  
 LA English  
 CC 76-2 (Electric Phenomena)

AB Ultrafast transient reflecting \*\*\*grating\*\*\* (TRG) spectroscopy was  
 utilized for defect anal. in the surface region of \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* for the \*\*\*implantation\*\*\* range  
 from 1011 to 1015 cm<sup>-2</sup>. To deduce signals due to trapped carriers at  
 defect states, the TRG spectra at the delay time of 30 ps were measured  
 because ultrafast carrier dynamics such as many-body recombination had  
 finished before the delay time. According to the dose quantity, the peak  
 of the interband transition was affected and also defect-related  
 transitions emerged. Using this technique, implantation damage can be  
 detected for samples with their dose larger than 1012 cm<sup>-2</sup>. It was  
 proposed that TRG spectroscopy can be used as a novel anal. method for  
 characterizing defects in the surface region of semiconductors.

ST semiconductor surface defect analysis transient reflecting \*\*\*grating\*\*\*  
 spectroscopy

IT Interband transition  
 \*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
 (defect anal. in surface region of \*\*\*ion\*\*\* - \*\*\*implanted\*\*\*  
 \*\*\*silicon\*\*\* by transient reflecting \*\*\*grating\*\*\* spectroscopy)

IT Semiconductor materials  
 Spectroscopy  
 Surface defects  
 (transient reflecting \*\*\*grating\*\*\* spectroscopy for defect anal.  
 in surface region of semiconductors)

IT 7440-21-3, \*\*\*Silicon\*\*\*, properties



RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(defect anal. in surface region of \*\*\*ion\*\*\* - \*\*\*implanted\*\*\*  
\*\*\*silicon\*\*\* by transient reflecting \*\*\*grating\*\*\* spectroscopy)

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

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L7 ANSWER 21 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2002:927766 CAPLUS

DN 138:10560

ED Entered STN: 06 Dec 2002

TI Method for deep and vertical dry etching of dielectric materials

IN Lamontagne, Boris; Erickson, Lynden; Xu, Dan-Xia; Delage, Andre; Janz, Siegfried; Cheben, Pavel; Charbonneau, Sylvain

PA LNL Technologies Canada Inc., Can.

SO PCT Int. Appl., 12 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM H01L021-311

CC 76-11 (Electric Phenomena)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002097874	A1	20021205	WO 2002-CA784	20020528
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
	CA 2349032	AA	20021128	CA 2001-2349032	20010528
PRAI	CA 2001-2349032	A	20010528		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2002097874	ICM	H01L021-311
	IPCI	H01L0021-311 [ICM,7]
CA 2349032	IPCI	H01L0021-461 [ICM,7]

AB The invention relates to a method for etching transparent dielects., such as \*\*\*silicon\*\*\* oxide, with vertical sidewalls for use in the manuf. of planar waveguides and \*\*\*gratings\*\*\*. The process is carried out at a high etch rate using low-energy \*\*\*ion\*\*\* \*\*\*bombardment\*\*\* using C4F8 as a main etchant gas. The \*\*\*silicon\*\*\* oxide sidewall profiles are controlled by varying the temp. of the sample.

ST deep vertical dry etching dielec material

IT Inductively coupled plasma

(etching by; method for deep and vertical dry etching of dielec. materials)

IT Sputtering

(etching, ion-beam; method for deep and vertical dry etching of dielec. materials)

IT Dielectric films  
(method for deep and vertical dry etching of dielec. materials)

IT Etching masks  
(sputter etching masks; method for deep and vertical dry etching of dielec. materials)

IT Etching  
(sputter, ion-beam; method for deep and vertical dry etching of dielec. materials)

IT 7631-86-9, Silica, processes  
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(dielec.; method for deep and vertical dry etching of dielec. materials)

IT 115-25-3, Octafluorocyclobutane  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(etchant; method for deep and vertical dry etching of dielec. materials)

IT 7429-90-5, Aluminum, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(etching mask; method for deep and vertical dry etching of dielec. materials)

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE  
(1) Blalock, G; US 5711851 A 1998 CAPLUS  
(2) Ding, J; US 5814563 A 1998 CAPLUS  
(3) Nulty, J; US 5468342 A 1995 CAPLUS

L7 ANSWER 22 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2002:543371 CAPLUS

DN 137:239136

ED Entered STN: 22 Jul 2002

TI Transient reflecting \*\*\*grating\*\*\* spectroscopy for defect analysis of surface region of semiconductors

AU Donen, Hiroshi; Katayama, Kenji; Sawada, Tsuguo

CS Department of Advanced Materials Science, The University of Tokyo, Graduate School of Frontier Sciences, Bunkyo-ku, Tokyo, 113-8656, Japan

SO Journal of Applied Physics (2002), 92(3), 1367-1371  
CODEN: JAPIAU; ISSN: 0021-8979

PB American Institute of Physics

DT Journal

LA English

CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
Section cross-reference(s): 66, 75, 77

AB Ultrafast transient reflecting \*\*\*grating\*\*\* (TRG) spectroscopy was applied to study the influence of various defect states on ultrafast carrier dynamics of up to 3 ps duration in an \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*Si\*\*\* surface region. The TRG spectra revealed the energy-state distribution of 2 kinds of defect states, and photoexcited carriers were trapped in each state depending on annealing time. Probably TRG spectroscopy can should be used as an anal. method for characterizing defects in the surface region of semiconductors.

ST arsenic implanted \*\*\*silicon\*\*\* surface defect transient reflecting \*\*\*grating\*\*\* spectroscopy; Raman arsenic implanted \*\*\*silicon\*\*\* surface defect transient reflecting \*\*\*grating\*\*\* ; visible arsenic implanted \*\*\*silicon\*\*\* surface defect transient reflecting \*\*\*grating\*\*\* ; annealing arsenic implanted \*\*\*silicon\*\*\* surface defect transient reflecting \*\*\*grating\*\*\* ; reflection transient laser \*\*\*grating\*\*\* arsenic implanted \*\*\*silicon\*\*\* surface defect; \*\*\*ion\*\*\* \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* transient reflecting \*\*\*grating\*\*\* surface defect arsenic

IT Annealing  
Electric current carriers  
\*\*\*Implanted\*\*\* \*\*\*ions\*\*\*  
Laser induced \*\*\*grating\*\*\*  
Optical reflection  
Surface

Surface defects  
 UV and visible spectra  
 (transient reflecting \*\*\*grating\*\*\* spectroscopy for defect anal.  
 of surface region of semiconductors)  
 IT 7440-21-3, \*\*\*Silicon\*\*\* , properties  
 RL: PRP (Properties)  
 (arsenic \*\*\*ion\*\*\* \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* ; transient  
 reflecting \*\*\*grating\*\*\* spectroscopy for defect anal. of surface  
 region of semiconductors)  
 IT 7440-38-2, Arsenic, properties  
 RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
 (surface; transient reflecting \*\*\*grating\*\*\* spectroscopy for  
 defect anal. of surface region of semiconductors)

RE.CNT 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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L7 ANSWER 23 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2002:138568 CAPLUS

DN 137:55211

ED Entered STN: 22 Feb 2002

TI Investigation of the dynamics of phase transitions on \*\*\*silicon\*\*\*  
 surface at light pulse heating

AU Fattakhov, Yakh'ya V.; Galyautdinov, Mansur F.; L'vova, Tat'yana N.;  
 Zakharov, M. V.; Khaibullin, Il'dus B.

CS Kazan Physical-Technical Institute of the Russia Academy of Sciences,  
 Kazan, 420029, Russia

SO Proceedings of SPIE-The International Society for Optical Engineering  
 (2001), 4605(Photon Echo and Coherent Spectroscopy), 399-408  
 CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

CC 76-2 (Electric Phenomena)

Section cross-reference(s): 66

AB The nucleation and growth of local molten regions (LMRs) during the light  
 irradsn. was detected using high-speed camera and long-focus microscope.  
 In situ dependences of sizes and d. (quantity per cm-2) of LMRs are  
 interpreted in the frame of the following model. A great amt. of heat is  
 transferred to the semiconductor surface during light pulse irradsn. This  
 process is nonstationary and the heat is not distributed homogeneously  
 over the thickness of the sample. As a result, a specific short-lived  
 state is formed, in which the semiconductor surface is superheated in the  
 solid-state phase with respect to the equil. melting temp. Some surface  
 areas, which contain the defects, begin to melt. Temp. of these local

molten regions immediately decreases down to the equil. melting temp. The created LMRs begin to absorb the heat from neighboring superheated solid regions. As a result, the temp. of superheated regions decreases down to the equil. m.p. No new local molten regions are formed and the sizes of existing local molten regions increase due to absorption of the energy of light pulse. To study the main features of local melting more detail in-situ studies of mechanism of this effect were carried out at incoherent light irradiation with different pulse durations and irradiation power densities. The last results agree with the superheating model. Also the dynamics of phase transitions on the surface of implanted \*\*\*Si\*\*\* at different regimes of light pulses is studied using high-speed camera and special diffraction \*\*\*gratings\*\*\*. The diffraction \*\*\*gratings\*\*\* were formed using \*\*\*ion\*\*\* \*\*\*implantation\*\*\* and the effect of local melting. The dynamics of diffraction during and after the light pulse irradiation was studied.

ST phase transition \*\*\*silicon\*\*\* surface light pulse heating; local  
molten region \*\*\*silicon\*\*\* surface light pulse heating  
IT Semiconductor materials  
Surface melting  
(in situ time dependences of sizes and d. of local molten regions on  
surface of implanted \*\*\*Si\*\*\* during light pulse heating)  
IT 7440-21-3, \*\*\*Silicon\*\*\*, processes  
RL: PEP (Physical, engineering or chemical process); PYP (Physical  
process); PROC (Process)  
(dynamics of phase transitions on surface of implanted \*\*\*Si\*\*\* at  
different regimes of light pulses using high-speed camera and special  
diffraction \*\*\*gratings\*\*\* )

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD

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Materials, Pt 1 1985, P280  
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CAPLUS  
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Russian) 1983  
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P1236 CAPLUS  
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P69

L7 ANSWER 24 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2001:690632 CAPLUS

DN 136:13104

ED Entered STN: 21 Sep 2001

TI Phase transition dynamics on semiconductor surface at light pulse  
irradiation

AU Fattakhov, Yakh'ya V.; Galyautdinov, Mansur F.; L'vova, Tat'yana N.;  
Khaibullin, Il'dus B.

CS Kazan Physical-Technical Institute of the Russian Academy of Sciences,  
Kazan Tatarstan, 420029, Russia

SO Proceedings of SPIE-The International Society for Optical Engineering  
(2001), 4183(High-Speed Photography and Photonics), 531-538  
CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

CC 75-7 (Crystallography and Liquid Crystals)

Section cross-reference(s): 66

AB The dynamics of anisotropic local melting of monocryst. and implanted  
\*\*\*Si\*\*\* at different regimes of light pulse irradiation was studied. The  
results of in situ study of local melting of monocryst. \*\*\*Si\*\*\* were  
carried out for the 1st time using special long-focus microscope and  
high-speed camera. The time dependences of the d. and sizes of local  
molten regions were systematically measured. The authors explain the  
increasing of the size of LMRs during short time by the superheating of  
the semiconductor in the solid state with respect to the equil. m.p. Due  
to superheating conditions are arisen to overcome the barrier for the  
formation of the liq. phase nuclei. The dynamics of anisotropic local

melting of implanted \*\*\*Si\*\*\* was studied using several optical methods and special diffraction \*\*\*gratings\*\*\*. The intensity of diffraction picture depends on the contrast of this periodical structure, i.e. From difference of cryst. and amorphous fragments of \*\*\*gratings\*\*\*. The dynamics of diffraction effectivity during and after the power light pulse was registered using high-speed camera. Three qual. stages: solid-state recrystn., local melting and liq.-phase recrystn. were obsd. exptl.

ST phase transition dynamics semiconductor surface light pulse irradsn  
IT \*\*\*Ion\*\*\* \*\*\*implantation\*\*\*

Light  
Semiconductor materials  
Structural phase transition  
Surface melting  
Surface phase transition  
(phase transition dynamics on \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* semiconductor surface at light pulse irradsn.)

IT Crystallization  
(surface; phase transition dynamics on implanted \*\*\*silicon\*\*\* semiconductor surface at light pulse irradsn.)

IT 7440-21-3, \*\*\*Silicon\*\*\*, processes  
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)  
(phase transition dynamics on implanted \*\*\*silicon\*\*\* semiconductor surface at light pulse irradsn.)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE  
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(2) Fattakhov, Y; Izvestiya Rossiyskoy Akademii Nauk Seriya fizicheskaya 1995, V59, P136 CAPLUS  
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L7 ANSWER 25 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 2001:676374 CAPLUS  
DN 135:233661  
ED Entered STN: 14 Sep 2001  
TI Integrated optocoupler and its manufacturing method  
IN Gebel, Thoralf; Skorupa, Wolfgang; Von Borany, Johannes; Rehbole, Lars; Borchert, Dietmar; Fahrner, Wolfgang R.  
PA Forschungszentrum Rossendorf E.V., Germany  
SO Eur. Pat. Appl., 8 pp.  
CODEN: EPXXDW  
DT Patent  
LA German  
IC ICM H01L031-173  
ICS H01L031-12; C23C014-48; H01L021-3115  
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
Section cross-reference(s): 76

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1132975	A1	20010912	EP 2001-105205	20010303
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
DE 10011258	A1	20010920	DE 2000-10011258	20000308
PRAI DE 2000-10011258	A	20000308		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 1132975	ICM	H01L031-173
	ICS	H01L031-12; C23C014-48; H01L021-3115
	IPCI	H01L0031-173 [ICM,6]; H01L0031-12 [ICS,6]; C23C0014-48 [ICS,6]; H01L0021-3115 [ICS,6]
	ECLA	H01L031/12B; H01L031/153
DE 10011258	IPCI	H01L0031-16 [ICM,7]; H01L0031-12 [ICS,7]
	ECLA	H01L031/12B; H01L031/153

AB Integrated optical \*\*\*couplers\*\*\* comprising a substrate supporting receiving and transmitting elements positioned adjacent to each other but

sepd. by a transparent elec. insulating material are described in which the transmitting element includes a nanocluster contg. dielec. layer and the receiving and transmitting elements are formed from a monolithic block. Methods for fabricating the \*\*\*couplers\*\*\* are also described which entail forming the nanocluster-contg. dielec. layer using an ion beam synthetic technique.

ST integrated optical \*\*\*coupler\*\*\* nanocluster contg dielec  
IT Optical \*\*\*couplers\*\*\*  
(integrated optical \*\*\*couplers\*\*\* with nanocluster contg. dielecs. and their fabrication)

IT \*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
Semiconductor device fabrication  
(integrated optical \*\*\*couplers\*\*\* with nanocluster contg. dielecs. and their fabrication using)

IT 7440-56-4, Germanium, uses  
RL: DEV (Device component use); MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(integrated optical \*\*\*couplers\*\*\* with nanocluster contg. dielecs. and their fabrication)

IT 7440-21-3, \*\*\*Silicon\*\*\*, uses 7631-86-9, Silica, uses  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(integrated optical \*\*\*couplers\*\*\* with nanocluster contg. dielecs. and their fabrication)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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L7 ANSWER 26 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 2001:672941 CAPLUS  
DN 135:363946  
ED Entered STN: 14 Sep 2001  
TI \*\*\*Si\*\*\* -doped luminescence \*\*\*gratings\*\*\*  
AU Heitmann, J.; McCallum, J. C.; Meijer, J.; Stephan, A.; Butz, T.; Zacharias, M.  
CS Exp. Department II, Max-Planck-Institut fur Mikrostrukturphysik, Saxony-Anhalt, Halle, D-06120, Germany  
SO Nuclear Instruments & Methods in Physics Research, Section B: Beam Interactions with Materials and Atoms (2001), 181, 263-267  
CODEN: NIMBEU; ISSN: 0168-583X  
PB Elsevier Science B.V.  
DT Journal  
LA English  
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB The authors report on the fabrication of ordered arrays of dots formed by \*\*\*Si\*\*\* implantation through a grid into SiO2 using the Bochum high-energy ion projector. Arrays of \*\*\*Si\*\*\* -implanted dots with dimensions in the micrometer and submicrometer range have been made. The samples show a strong red photoluminescence at room temp. By the combination of .mu.-photoluminescence measurements and at. force microscopy studies optical and structural characterization of the produced structures was possible. Addnl. studies by high-resoln. TEM, x-ray diffraction and temp.-dependent photoluminescence on conventionally implanted samples have been performed for comparison.

ST \*\*\*silicon\*\*\* \*\*\*ion\*\*\* \*\*\*implantation\*\*\* silica luminescent \*\*\*grating\*\*\*  
IT \*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
( \*\*\*Si\*\*\* - \*\*\*doped\*\*\* luminescence \*\*\*gratings\*\*\* )  
IT Diffraction \*\*\*gratings\*\*\*  
(photoluminescent; \*\*\*Si\*\*\* -doped luminescence \*\*\*gratings\*\*\* )  
IT 7631-86-9, Silica, properties  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
( \*\*\*Si\*\*\* -doped luminescence \*\*\*gratings\*\*\* )  
IT 7440-21-3D, \*\*\*Silicon\*\*\*, \*\*\*ions\*\*\*, processes

RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 ( \*\*\*Si\*\*\* - \*\*\*doped\*\*\* luminescence \*\*\*gratings\*\*\* )

RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L7 ANSWER 27 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2001:672696 CAPLUS

DN 135:279868

ED Entered STN: 14 Sep 2001

TI Efficient blue light emission from \*\*\*silicon\*\*\* : The first integrated  
 \*\*\*Si\*\*\* -based optocoupler

AU Rebohle, L.; Von Borany, J.; Borchert, D.; Frob, H.; Gebel, T.; Helm, M.;  
 Skorupa, W.

CS Fraunhofer-Institut Solare Energiesysteme, Freiburg, 79100, Germany

SO Wissenschaftlich-Technische Berichte - Forschungszentrum Rossendorf  
 (2001), FZR-314, 12-15

CODEN: WBFRLF; ISSN: 1437-322X

DT Report

LA German

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)

Section cross-reference(s): 76

AB The suitability of Ge-implanted SiO2 layers for optoelectronic  
 applications was studied. SiO2 films with a thickness 130-500 nm on [100]  
 oriented, n-type \*\*\*Si\*\*\* substrates were thermally grown at  
 1000.degree. and \*\*\*implanted\*\*\* with Ge \*\*\*ions\*\*\*. Rapid  
 thermal annealing at 100.degree. was applied with annealing times between  
 1 s and 30 s. Metal-oxide-semiconductor device structures for  
 electroluminescence (EL) studies were prep'd. using sputtered 80 nm thick  
 of In Sn oxide layer and Al as the top and bottom electrodes, resp. EL  
 and luminescence (PL) were measured at room temp. Both EL and PL spectra  
 were peaked in the violet spectral region at 3.18 eV and apart from a  
 marginally broader width of the EL peak, the spectra were almost  
 identical. This means that the luminescence for both PL and EL was caused  
 by the same type of luminescence center. The fabrication of an integrated  
 optocoupler based on Ge-impregnated SiO2 demonstrated that the films were  
 applicable for optoelectronics.

ST electroluminescence blue germanium implanted silica optical  
 \*\*\*coupler\*\*\*

IT Luminescence  
 Luminescence, electroluminescence  
 (blue; efficient from \*\*\*silicon\*\*\* integrated optocoupler)

IT Optical \*\*\*couplers\*\*\*  
 (efficient blue light emission from \*\*\*silicon\*\*\* integrated)

IT 7440-21-3, \*\*\*Silicon\*\*\*, properties  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical  
 process); PRP (Properties); PROC (Process); USES (Uses)  
 (efficient blue light emission from \*\*\*silicon\*\*\* integrated  
 optocoupler)

IT 15888-69-4, Germanium(1+), properties  
 RL: DEV (Device component use); MOA (Modifier or additive use); PEP  
 (Physical, engineering or chemical process); PRP (Properties); PROC  
 (Process); USES (Uses)  
 (efficient blue light emission from \*\*\*silicon\*\*\* integrated  
 optocoupler contg. silica implanted with)

IT 7631-86-9, Silica, properties  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical

process); PRP (Properties); PROC (Process); USES (Uses)  
(germanium-implanted; efficient blue light emission from  
\*\*\*silicon\*\*\* integrated optocoupler contg. germanium-implanted)  
RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE  
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p-rm.htm  
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L7 ANSWER 28 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 2001:631400 CAPLUS  
DN 135:350395  
ED Entered STN: 31 Aug 2001  
TI In situ investigation of phase transitions of implanted \*\*\*silicon\*\*\*  
at powerful light irradiation  
AU Fattakhov, Y. V.; Galyautdinov, M. F.; L'vova, T. N.; Khaibullin, I. B.  
CS Kazan Physical-Technical Institute of the Russian Academy of Sciences,  
Kazan, Tatarstan, 420029, Russia  
SO Vacuum (2001), 63(4), 649-655  
CODEN: VACUAV; ISSN: 0042-207X  
PB Elsevier Science Ltd.  
DT Journal  
LA English  
CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other  
Reprographic Processes)  
Section cross-reference(s): 75, 76  
AB The in situ studies of anisotropic local melting of implanted and  
monocryst. \*\*\*Si\*\*\* during irradiation by powerful light pulses using a  
high-speed camera are presented. The methods of formation of special  
diffraction \*\*\*gratings\*\*\* are presented. The features of application  
of the \*\*\*gratings\*\*\* for the in situ study of structural and phase  
transitions of implanted \*\*\*Si\*\*\* are discussed. One-dimensional  
\*\*\*gratings\*\*\* were formed by \*\*\*ion\*\*\* \*\*\*implantation\*\*\* and a  
special regime of laser annealing. The 2-dimensional \*\*\*gratings\*\*\*  
were formed by \*\*\*ion\*\*\* \*\*\*implantation\*\*\* through a metallic net  
shadow-mask or using photolithog. Also, the 1st results of in situ study  
of the effect of anisotropic local melting of monocryst. \*\*\*Si\*\*\* are  
presented. In situ time dependences of d. (quantity per cm<sup>2</sup>) of local  
molten regions are interpreted in the frame of the following model: the  
existence of a short-lived metastable state, characterized by superheating  
in the solid phase. The expts. and theor. calcns. crucial to clarify the  
mechanism of the effect in question are discussed.  
ST phase transition \*\*\*ion\*\*\* \*\*\*implant\*\*\* \*\*\*silicon\*\*\*  
radiation  
IT Diffraction \*\*\*gratings\*\*\*  
\*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
Laser annealing  
Metastable state (energy level)  
Phase transition  
Photolithography  
(in situ study of phase transitions of implanted \*\*\*silicon\*\*\* at  
powerful light irradiation.)  
IT Melting  
(local; in situ study of phase transitions of implanted \*\*\*silicon\*\*\*  
at powerful light irradiation.)  
IT 7440-21-3, \*\*\*Silicon\*\*\*, properties  
RL: PRP (Properties)  
(in situ study of phase transitions of implanted \*\*\*silicon\*\*\* at  
powerful light irradiation.)  
RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE  
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- (9) Singh, R; J Appl Phys 1988, V63, PR59 CAPLUS
- (10) Usenko, A; J Mater Sci 1993, V4, P89 CAPLUS

L7 ANSWER 29 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2001:477341 CAPLUS

DN 135:218378

ED Entered STN: 03 Jul 2001

TI A compact optical encoder with micromachined photodetector

AU Hane, K.; Endo, T.; Ito, Y.; Sasaki, M.

CS Department of Mechatronics and Precision Engineering, Tohoku University, Sendai, 980-8579, Japan

SO Journal of Optics A: Pure and Applied Optics (2001), 3(3), 191-195

CODEN: JOAOF8; ISSN: 1464-4258

PB Institute of Physics Publishing

DT Journal

LA English

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB A compact optical encoder was fabricated using a micromachining technique for the measurement of linear displacement. The index \*\*\*grating\*\*\* for detecting the Moire signal from the superimposed \*\*\*gratings\*\*\* consists of transmission type \*\*\*Si\*\*\* grids, which are etched through by the reactive ion plasma. An array of line photodetectors is installed on the \*\*\*Si\*\*\* grids by \*\*\*ion\*\*\* \*\*\*implantation\*\*\*. A scale \*\*\*grating\*\*\* is illuminated by the light passing through the slits of the transmission index \*\*\*grating\*\*\*, and thus the light source can be placed just behind the index \*\*\*grating\*\*\*. Therefore the structure of the proposed optical encoder is compact. In the expt., the 2nd order \*\*\*grating\*\*\* imaging phenomenon under incoherent illumination was applied to the displacement sensing. The encoder signal with a high contrast is obtained at a large air gap between the 2 \*\*\*gratings\*\*\*.

ST compact optical encoder micromachine photodetector

IT Illumination

Imaging

\*\*\*Ion\*\*\* \*\*\*implantation\*\*\*

Light sources

Micromachining

Optical detectors

Plasma

(a compact optical encoder with micromachined photodetector)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L7 ANSWER 30 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2001:456372 CAPLUS

DN 135:217893

ED Entered STN: 24 Jun 2001

TI Efficient blue light emission from \*\*\*silicon\*\*\* the first integrated \*\*\*Si\*\*\* -based optocoupler

AU Rebohle, L.; Von Borany, J.; Borchert, D.; Frob, H.; Gebel, T.; Helm, M.; Moller, W.; Skorupa, W.

CS Institut fur Ionenstrahlphysik und Materialforschung, Forschungszentrum Rossendorf e.V., Dresden, 01314, Germany

SO Electrochemical and Solid-State Letters (2001), 4(7), G57-G60

CODEN: ESLEF6; ISSN: 1099-0062

PB Electrochemical Society

DT Journal

LA English

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB The authors present the 1st all- \*\*\*Si\*\*\* integrated optocoupler, whose fabrication, using \*\*\*ion\*\*\* \*\*\*implantation\*\*\* into SiO<sub>2</sub>, is completely compatible with std. \*\*\*Si\*\*\* technol. It is based on Ge-implanted SiO<sub>2</sub> layers as light emitter exhibiting bright blue-violet electroluminescence light with a record wall-plug efficiency of 0.5%. The electroluminescence is explained with a model in which electrons enter the SiO<sub>2</sub> layer via tunnel injection and excite the luminescence centers by impact excitation or field ionization. A radiative T<sub>1</sub>-S<sub>0</sub> transition of these luminescence centers then causes the obsd. electroluminescence. Finally, these optocoupling devices hold great promise for integrated optoelectronic applications, esp. in the field of sensor and biotechnol.

ST electroluminescence blue germanium implanted silica optical \*\*\*coupler\*\*\*

IT Luminescence, electroluminescence  
Optical \*\*\*couplers\*\*\*  
(efficient blue light emission from \*\*\*silicon\*\*\* first integrated \*\*\*Si\*\*\* -based optocoupler)

IT 7631-86-9, Silica, properties  
RL: PRP (Properties)  
(germanium-implanted; efficient blue light emission from \*\*\*silicon\*\*\* first integrated \*\*\*Si\*\*\* -based optocoupler)

RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L7 ANSWER 31 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2001:391129 CAPLUS

DN 135:187219

ED Entered STN: 31 May 2001

TI Virtual mesa and spoiler midinfrared angled- \*\*\*grating\*\*\* distributed feedback lasers fabricated by \*\*\*ion\*\*\* \*\*\*bombardment\*\*\*

AU Bartolo, R. E.; Bewley, W. W.; Felix, C. L.; Vurgaftman, I.; Lindle, J. R.; Meyer, J. R.; Knies, D. L.; Grabowski, K. S.; Turner, G. W.; Manfra, M. J.

CS Naval Research Laboratory, Washington, DC, 20375, USA

SO Applied Physics Letters (2001), 78(22), 3394-3396  
CODEN: APPLAB; ISSN: 0003-6951

PB American Institute of Physics

DT Journal

LA English

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
Section cross-reference(s): 76

AB The suppression of parasitic Fabry-Perot-like lasing modes substantially enhances the beam quality and brightness of wide-stripe angled-  
\*\*\*grating\*\*\* distributed feedback lasers emitting in the mid-IR. The direct facet-to-facet gain path is blocked by loss regions that are created by \*\*\*ion\*\*\* \*\*\*bombardment\*\*\* with 900 keV \*\*\*Si\*\*\*  
\*\*\*ions\*\*\*. Both virtual mesa structures, in which loss regions bound both sides of the 300-.mu.m-wide angled gain path, and spoiler structures, in which loss is induced only near the facets, decrease the etendue of the output by nearly an order of magnitude, and increase the brightness by up to a factor of 3.

ST IR distributed feedback laser virtual mesa spoiler

IT IR lasers

Semiconductor lasers

(virtual mesa and spoiler mid-IR angled- \*\*\*grating\*\*\* distributed feedback lasers for improved beam quality and brightness)

IT 1303-11-3, Indium arsenide (InAs), uses 12064-03-8, Gallium antimonide (GaSb) 111747-98-9, Aluminum antimony arsenide (AlSb0.92As0.08) 120862-37-5, Gallium indium antimonide (Ga0.85In0.15Sb)

RL: DEV (Device component use); USES (Uses)

(virtual mesa and spoiler mid-IR angled- \*\*\*grating\*\*\* distributed feedback lasers using)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L7 ANSWER 32 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2001:377006 CAPLUS

DN 134:373877

ED Entered STN: 25 May 2001

TI X-ray device

IN Kitamura, Msaru; Fujiwara, Shigenori; Katayama, Masahiro

PA Toshiba Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM G21K001-06

ICS G21K001-06; G21K001-00; H05H013-04

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 8, 63

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001141893	A2	20010525	JP 1999-328473	19991118

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2001141893	ICM	G21K001-06
	ICS	G21K001-06; G21K001-00; H05H013-04
	IPCI	G21K0001-06 [ICM,7]; G21K0001-06 [ICS,7]; G21K0001-00 [ICS,7]; H05H0013-04 [ICS,7]

AB The invention relates to a \*\*\*Si\*\*\* crystal x-ray \*\*\*grating\*\*\*, suited for use in a SOR beam line for angiog. applications, wherein oxygen or carbon ions are injected to the \*\*\*Si\*\*\* crystal for controlling the x-ray reflection properties.

ST \*\*\*silicon\*\*\* crystal x ray \*\*\*grating\*\*\*

IT X-ray devices

(crystal \*\*\*grating\*\*\*; x-ray crystal \*\*\*grating\*\*\* )

IT \*\*\*Ion\*\*\* \*\*\*bombardment\*\*\*

(x-ray crystal \*\*\*grating\*\*\* )  
 IT 7440-21-3, \*\*\*Silicon\*\*\* , uses  
 RL: DEV (Device component use); USES (Uses)  
 (x-ray crystal \*\*\*grating\*\*\* )  
 IT 7631-86-9, Silica, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (x-ray crystal \*\*\*grating\*\*\* )  
 IT 7440-44-0, Carbon, uses 7782-44-7, Oxygen, uses  
 RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical  
 process); PROC (Process); USES (Uses)  
 (x-ray crystal \*\*\*grating\*\*\* )

L7 ANSWER 33 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2001:361127 CAPLUS

DN 135:159881

ED Entered STN: 20 May 2001

TI Low loss all- \*\*\*silicon\*\*\* single mode optical waveguide with small  
 cross-section

AU Cocorullo, G.; Della Corte, F. G.; Iodice, M.; Polichetti, T.; Rendina,  
 I.; Sarro, P. M.

CS DEIS, University of Calabria, Cosenza, Italy

SO Fiber and Integrated Optics (2001), 20(3), 207-219

CODEN: FOIOD2; ISSN: 0146-8030

PB Taylor & Francis Ltd.

DT Journal

LA English

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)

AB The realization of single-mode rib waveguides in std. epitaxial \*\*\*Si\*\*\*  
 layer on lightly- \*\*\*doped\*\*\* \*\*\*Si\*\*\* substrate, using \*\*\*ion\*\*\*  
 - \*\*\*implantation\*\*\* to form the lower cladding, is reported. The  
 waveguides were designed with a cross-section comparable in size to the  
 mode-field-diam. of std. single-mode optical fiber, so reducing the  
 fiber-waveguide coupling losses. Propagation losses of .apprx.1.0 dB/cm,  
 for .lambda. = 1.3 .mu.m, in the single mode regime, were measured.  
 Numerical evaluation of the theor. attenuation and the transverse optical  
 field profiles was performed, both for .lambda. = 1.3 .mu.m and .lambda. =  
 1.55 .mu.m. The proposed technique is low-cost, fully compatible with  
 std. very large scale integration (VLSI) processes.

ST \*\*\*silicon\*\*\* optical waveguide

IT Fiber optics

(fiber-optic \*\*\*couplers\*\*\* ; low loss all- \*\*\*silicon\*\*\* single  
 mode optical waveguide with small cross-section)

IT Optical \*\*\*couplers\*\*\*

(fiber-optic; low loss all- \*\*\*silicon\*\*\* single mode optical  
 waveguide with small cross-section)

IT Cladding

Doping

Epitaxy

\*\*\*Ion\*\*\* \*\*\*implantation\*\*\*

Optical fibers

(low loss all- \*\*\*silicon\*\*\* single mode optical waveguide with  
 small cross-section)

IT Optical waveguides

(rib; low loss all- \*\*\*silicon\*\*\* single mode optical waveguide with  
 small cross-section)

IT 7440-21-3, \*\*\*Silicon\*\*\* , uses

RL: DEV (Device component use); TEM (Technical or engineered material  
 use); USES (Uses)

(low loss all- \*\*\*silicon\*\*\* single mode optical waveguide with  
 small cross-section)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L7 ANSWER 34 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 2001:183317 CAPLUS  
DN 134:316500  
ED Entered STN: 16 Mar 2001  
TI Pattern writing by implantation in a large-scale PSII system with planar inductively coupled plasma source  
AU Wu, Lingling; Gao, Hongjun; Manos, Dennis M.  
CS Applied Science Department, College of William and Mary, Williamsburg, VA, 23187, USA  
SO Materials Research Society Symposium Proceedings (2000), 625(Solid Freeform and Additive Fabrication), 111-116  
CODEN: MRSPDH; ISSN: 0272-9172  
PB Materials Research Society  
DT Journal  
LA English  
CC 66-3 (Surface Chemistry and Colloids)  
Section cross-reference(s): 76  
AB A large-scale plasma source immersion \*\*\*ion\*\*\* \*\*\*implantation\*\*\* (PSII) system with planar coil RFI plasma source has been used to study an inkless, deposition-free, mask-based surface conversion patterning as an alternative to direct writing techniques on large-area substrates by implantation. The app. has a 0.61 m ID and 0.51 m tall chamber, with a base pressure in the 10<sup>-8</sup> Torr range, making it one of the largest PSII presently available. The system uses a 0.43 m ID planar rf antenna to produce dense plasma capable of large-area, uniform materials treatment. Metallic and semiconductor samples have been implanted through masks to produce small geometric patterns of interest for device manufg.  
\*\*\*Si\*\*\* \*\*\*gratings\*\*\* were also implanted to study application to smaller features. Samples are characterized by AES, TEM and variable-angle spectroscopic ellipsometry. Compn. depth profiles obtained by AES and VASE are compared. Measured lateral and depth profiles are compared to the mask features to assess lateral diffusion, pattern transfer fidelity, and wall-effects. The paper also presents the results of MAGIC calcns. of the flux and angle of ion trajectories through the boundary layer predicting the magnitude of flux as a function of 3-D location on objects in the expanding sheath.  
ST \*\*\*ion\*\*\* \*\*\*implantation\*\*\* surface patterning  
IT \*\*\*Implanted\*\*\* \*\*\*ions\*\*\*  
\*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
Plasma  
Surface  
(pattern writing by \*\*\*implantation\*\*\* in a large-scale PSII system with planar inductively coupled plasma source)  
IT 7440-21-3, \*\*\*Silicon\*\*\*, processes 7440-25-7, Tantalum, processes 7440-32-6, Titanium, processes 12597-68-1, Stainless steel, processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(pattern writing by implantation in a large-scale PSII system with planar inductively coupled plasma source)  
IT 7727-37-9, Nitrogen, processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(plasma; pattern writing by implantation in a large-scale PSII system with planar inductively coupled plasma source)  
RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE  
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(2) Goplen, B; Magic User's Manual 1997  
(3) Hopwood, J; Plasma Sources Sci and Technol 1992, V1, P109 CAPLUS  
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(9) Qin, S; JVST B 1994, V12(2), P962 CAPLUS  
(10) Tuszewski, M; JVST B 1994, V12(2), P973 CAPLUS  
(11) Venhaus, T; dissertation College of William and Mary 1999  
(12) Wood, B; JVST B 1994, V12(2), P870 CAPLUS  
L7 ANSWER 35 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2001:183289 CAPLUS  
 DN 134:359422  
 ED Entered STN: 16 Mar 2001  
 TI Pattern writing by implantation in a large-scale PSII system with planar inductively coupled plasma source  
 AU Wu, Lingling; Gao, Hongjun; Manos, Dennis M.  
 CS Applied Science Department, College of William and Mary, Williamsburg, VA, 23187, USA  
 SO Materials Research Society Symposium Proceedings (2001), 624 (Materials Development for Direct Write Technologies), 205-210  
 CODEN: MRSPDH; ISSN: 0272-9172  
 PB Materials Research Society  
 DT Journal  
 LA English  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 76  
 AB A large-scale plasma source immersion \*\*\*ion\*\*\* \*\*\*implantation\*\*\* (PSII) system with planar coil RFI plasma source has been used to study an inkless, deposition-free, mask-based surface conversion patterning as an alternative to direct writing techniques on large-area substrates by implantation. The app. has a 0.61 m ID and 0.51 m tall chamber, with a base pressure in the 10-8 Torr range, making it one of the largest PSII presently available. The system uses a 0.43 m ID planar rf antenna to produce dense plasma capable of large-area, uniform materials treatment. Metallic and semiconductor samples have been implanted through masks to produce small geometric patterns of interest for device manufg.  
 \*\*\*Si\*\*\* \*\*\*gratings\*\*\* were also implanted to study application to smaller features. Samples are characterized by AES, TEM and variable-angle spectroscopic ellipsometry. Compn. depth profiles obtained by AES and VASE are compared. Measured lateral and depth profiles are compared to the mask features to assess lateral diffusion, pattern transfer fidelity, and wall-effects. The paper also presents the results of MAGIC calcns. of the flux and angle of ion trajectories through the boundary layer predicting the magnitude of flux as a function of 3-D location on objects in the expanding sheath.  
 ST plasma source immersion \*\*\*ion\*\*\* \*\*\*implantation\*\*\* system surface patterning; lithog microfabrication plasma source immersion  
 IT \*\*\*ion\*\*\* \*\*\*implantation\*\*\* surface patterning  
 IT \*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
 (imagewise; large-scale plasma source immersion \*\*\*ion\*\*\*  
 \*\*\*implantation\*\*\* system applied for patterning of metal and semiconductor surfaces through mask)  
 IT Plasma  
 (large-scale plasma source immersion \*\*\*ion\*\*\* \*\*\*implantation\*\*\* system applied for patterning of metal and semiconductor surfaces through mask)  
 IT Ion beam lithography  
 Semiconductor device fabrication  
 (large-scale plasma source immersion \*\*\*ion\*\*\* \*\*\*implantation\*\*\* system applied for patterning of metal and semiconductor surfaces through mask in relation to)  
 IT 25583-20-4, Titanium nitride (TiN)  
 RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)  
 (large-scale plasma source immersion \*\*\*ion\*\*\* \*\*\*implantation\*\*\* system applied for patterning of metal and semiconductor surfaces through mask)  
 IT 7727-37-9D, Nitrogen, ions, processes  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (large-scale plasma source immersion \*\*\*ion\*\*\* \*\*\*implantation\*\*\* system applied for patterning of metal and semiconductor surfaces through mask)  
 IT 7440-21-3, \*\*\*Silicon\*\*\*, processes 7440-25-7, Tantalum, processes 7440-32-6, Titanium, processes 12597-68-1, Stainless steel, processes  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (substrate; large-scale plasma source immersion \*\*\*ion\*\*\*  
 \*\*\*implantation\*\*\* system applied for patterning of metal and semiconductor surfaces through mask)  
 RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE  
 (1) Chen, A; JVST B 1994, V12(2), P918 CAPLUS

- (2) Goplen, B; Magic User's Manual 1997
- (3) Hopwood, J; Plasma Sources Sci and Technol 1992, V1, P109 CAPLUS
- (4) Implant Sciences Corporation; Profile Code Software Instruction Manual Version 3.20
- (5) JA Woollam Co Inc; Guide to using WVASE32
- (6) Lieberman, M; Principles of Plasma Discharges and Materials Processing 1994, P387
- (7) Malik, S; JVST B 1994, V12(2), P843 CAPLUS
- (8) Matossian, J; JVST B 1994, V12(2), P850 CAPLUS
- (9) Qin, S; JVST B 1994, V12(2), P962 CAPLUS
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- (11) Venhaus, T; dissertation College of William and Mary 1999
- (12) Wood, B; JVST B 1994, V12(2), P870 CAPLUS

L7 ANSWER 36 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2001:102602 CAPLUS  
 DN 134:287111  
 ED Entered STN: 12 Feb 2001  
 TI Improved near-infrared spectral responsivity scale  
 AU Shaw, Ping-Shine; Larason, Thomas C.; Gupta, Rajeev; Brown, Steven W.;  
 Lykke, Keith R.  
 CS National Institute of Standards and Technology, Gaithersburg, MD,  
 20899-0001, USA  
 SO Journal of Research of the National Institute of Standards and Technology  
 (2000), 105(5), 689-700  
 CODEN: JRITEF; ISSN: 1044-677X  
 PB National Institute of Standards and Technology  
 DT Journal  
 LA English  
 CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)  
 AB A cryogenic radiometer-based system was constructed at the National  
 Institute of Stds. and Technol. for abs. radiometric measurements to  
 improve detector spectral power responsivity scales in the wavelength  
 range from 900 nm to 1800 nm. In addn. to the liq.-He-cooled cryogenic  
 radiometer, the system consists of a 100 W quartz-W-halogen lamp light  
 source and a 1 m single- \*\*\*grating\*\*\* monochromator for wavelength  
 selection. The system was characterized and the uncertainty in spectral  
 power responsivity measurements evaluated. A variety of photodetectors,  
 including In Ga arsenide photodiodes (InGaAs), Ge photodiodes, and  
 pyroelec. detectors, were subsequently calibrated. Over most of the  
 spectral range, the spectral power responsivity of the photodetectors can  
 be measured with a combined relative std. uncertainty of 0.4% or less.  
 This is more than a factor of two smaller than the authors' previous  
 capabilities, and represents a significant improvement in the near IR  
 (NIR) spectral power responsivity scale maintained at NIST. The authors  
 discuss the characterization of the monochromator-based system and present  
 results of photodetector spectral power responsivity calibrations.  
 ST near IR spectral responsivity scale  
 IT Optical detectors  
 (IR; improved near-IR spectral responsivity scale using optical  
 detectors)  
 IT Radiation detectors  
 (cryogenic; improved near-IR spectral responsivity scale using optical  
 detectors)  
 IT Standards, physical  
 (improved near-IR spectral responsivity scale using glass \*\*\*doped\*\*\*  
 with rare earth \*\*\*ions\*\*\* )  
 IT Glass, properties  
 RL: PRP (Properties)  
 (improved near-IR spectral responsivity scale using glass \*\*\*doped\*\*\*  
 with rare earth \*\*\*ions\*\*\* )  
 IT Rare earth metals, properties  
 RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
 (ions; improved near-IR spectral responsivity scale using glass  
 \*\*\*doped\*\*\* with rare earth \*\*\*ions\*\*\* )  
 IT 7440-00-8, Neodymium, properties 7440-19-9, Samarium, properties  
 7440-64-4, Ytterbium, properties  
 RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
 (improved near-IR spectral responsivity scale using glass \*\*\*doped\*\*\*  
 with rare earth \*\*\*ions\*\*\* )  
 IT 7440-21-3, \*\*\*Silicon\*\*\* , properties 7440-56-4, Germanium,

properties 106070-25-1, Gallium indium arsenide

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(improved near-IR spectral responsivity scale using optical detectors)

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L7 ANSWER 37 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2001:4301 CAPLUS

DN 134:185418

ED Entered STN: 03 Jan 2001

TI Investigation of \*\*\*Si\*\*\* nanocrystals embedded into porous SiO2 matrix

AU Mikulskas, I.; Sulcas, R.; Tomasiunas, R.; Pelant, I.; Rehspringer, J. L.; Honerlage, B.

CS Inst. of Mater. Science and Applied Research, Vilnius Univ., Vilnius, 2040, Lithuania

SO Lietuvos Fizikos Zurnalas (2000), 40(1-3), 160-163

CODEN: LFZUE7; ISSN: 1392-1932

PB Lietuvos Fiziku Draugija

DT Journal

LA English

CC 73-5. (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 57, 66, 76

AB \*\*\*Si\*\*\* + \*\*\*ion\*\*\* \*\*\*implanted\*\*\* sol-gel SiO2 film on a SiO2 substrate was studied by structural and optical methods. From at. force images of the films \*\*\*Si\*\*\* nanocrystallites were found. The implanted sol-gel film exhibits room temp. photoluminescence peaked in the blue spectral region and the decay of photoluminescence is considerably faster, as was obtained in implanted thermal SiO2 films on cryst. \*\*\*Si\*\*\* and where photoluminescence was in the red spectral region. From transient dynamic \*\*\*grating\*\*\* expt. rather long carrier lifetimes were revealed under a relative high energy quantum excitation, which indicated effective photoexcited carrier capture into the SiO2 matrix states.

ST \*\*\*silicon\*\*\* nanocrystal embedded porous silica matrix elec optical property; defect \*\*\*silicon\*\*\* nanocrystal embedded porous silica elec optical property; four wave mixing \*\*\*silicon\*\*\* nanocrystal embedded porous silica matrix; surface structure \*\*\*silicon\*\*\* nanocrystal embedded porous silica matrix; luminescence decay \*\*\*silicon\*\*\* nanocrystal embedded porous silica matrix; carrier lifetime \*\*\*silicon\*\*\* nanocrystal embedded porous silica matrix; diffraction \*\*\*grating\*\*\* dynamic \*\*\*silicon\*\*\* nanocrystal embedded porous silica matrix; photocarrier \*\*\*silicon\*\*\* nanocrystal embedded porous silica matrix optical property; sol gel silica porous matrix nanocrystal \*\*\*silicon\*\*\* optical property; capture carrier \*\*\*silicon\*\*\* nanocrystal embedded porous silica matrix

IT Sol-gel processing  
(coating; \*\*\*silicon\*\*\* nanocrystals embedded into porous silica matrix)

IT Diffraction \*\*\*gratings\*\*\*  
(dynamic; \*\*\*silicon\*\*\* nanocrystals embedded into porous silica matrix)

IT Electric current carriers  
(lifetime; \*\*\*silicon\*\*\* nanocrystals embedded into porous silica matrix)

IT Electric current carriers  
(photocarriers; \*\*\*silicon\*\*\* nanocrystals embedded into porous



silica matrix)  
IT \*\*\*Implanted\*\*\* \*\*\*ions\*\*\*  
( \*\*\*silicon\*\*\* monocation; \*\*\*silicon\*\*\* nanocrystals embedded  
into porous silica matrix)  
IT Defects in solids  
Electron capture  
Fluorescence decay  
Four wave mixing  
Luminescence  
Surface structure  
UV and visible spectra  
( \*\*\*silicon\*\*\* nanocrystals embedded into porous silica matrix)  
IT Silica gel, properties  
RL: PRP (Properties)  
( \*\*\*silicon\*\*\* nanocrystals embedded into porous silica matrix)  
IT Nanocrystals  
( \*\*\*silicon\*\*\* ; \*\*\*silicon\*\*\* nanocrystals embedded into porous  
silica matrix)  
IT Coating process  
(sol-gel; \*\*\*silicon\*\*\* nanocrystals embedded into porous silica  
matrix)  
IT 7440-21-3, \*\*\*Silicon\*\*\* , properties  
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
(nanocrystals; \*\*\*silicon\*\*\* nanocrystals embedded into porous  
silica matrix)  
IT 7631-86-9, Silica, properties  
RL: PRP (Properties)  
(porous matrix; \*\*\*silicon\*\*\* nanocrystals embedded into porous  
silica matrix)  
RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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L7 ANSWER 38 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1999:797719 CAPLUS  
DN 132:144589  
ED Entered STN: 19 Dec 1999  
TI Application of laser-based linear and nonlinear surface acoustic waves in  
materials analysis  
AU Hess, P.; Frass, A.; Lomonosov, A.  
CS Institute of Physical Chemistry, University of Heidelberg, Heidelberg,  
69120, Germany  
SO Acta Physica Sinica (Overseas Edition) (1999), 8(Suppl.), S212-S218  
CODEN: APHSEU; ISSN: 1004-423X  
PB Chinese Physical Society  
DT Journal  
LA English  
CC 75-4 (Crystallography and Liquid Crystals)  
Section cross-reference(s): 73, 76  
AB Pulsed ns or ps Nd:YAG lasers were used to excite surface acoustic wave  
pulses and \*\*\*gratings\*\*\*. Michelson interferometry and laser  
probe-beam deflection were employed to monitor the transient surface  
displacement and surface velocity, resp. The thickness and elastic  
consts. of amorphous layers generated by \*\*\*ion\*\*\*  
\*\*\*implantation\*\*\* in a \*\*\*silicon\*\*\* crystal wafer were detd. The  
propagation of broadband nonlinear surface pulses in anisotropic  
\*\*\*silicon\*\*\* crystals was studied exptl. and theor. The excitation of  
narrow band nonlinear transient \*\*\*gratings\*\*\* on a \*\*\*silicon\*\*\*  
surface was achieved. Generation of higher harmonics was caused by the  
nonlinear photoacoustic excitation process at the source and not by  
propagation in a nonlinear medium.  
ST laser generated surface acoustic wave mech property detn  
IT Elasticity  
Mechanical properties  
(laser-generated linear and nonlinear surface acoustic waves in detn.

of)  
 IT IR laser radiation  
 Surface acoustic wave  
 UV laser radiation  
 (laser-generated linear and nonlinear surface acoustic waves in mech.  
 property detn.)  
 IT Testing of materials  
 (nondestructive; laser-generated linear and nonlinear surface acoustic  
 waves in relation to)  
 IT 7440-37-1, Argon, properties  
 RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical  
 process); PRP (Properties); PROC (Process); USES (Uses)  
 (laser-generated linear and nonlinear surface acoustic waves in mech.  
 property detn.)  
 IT 7440-21-3, \*\*\*Silicon\*\*\*, properties  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
 PROC (Process)  
 (laser-generated linear and nonlinear surface acoustic waves in mech.  
 property detn.)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD

- RE  
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 Meeting of the Acoustical Society of America 1998, VIII, P1557  
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L7 ANSWER 39 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1999:360496 CAPLUS  
 DN 131:163123  
 ED Entered STN: 11 Jun 1999  
 TI Mode-selective coupling structures for monolithic integrated  
 waveguide-detector systems  
 AU Koster, Tom M.; Houtsmma, V. E.; Lambeck, Paul V.; Klunder, D.; Popma, Th.  
 J. A.; Holleman, J.  
 CS Lightwave Devices Group, MESA Res. Inst., Univ. of Twente, Enschede, Neth.  
 SO Proceedings of SPIE-The International Society for Optical Engineering  
 (1999), 3630 (Silicon-Based Optoelectronics), 9-18  
 CODEN: PSISDG; ISSN: 0277-786X  
 PB SPIE-The International Society for Optical Engineering  
 DT Journal  
 LA English  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)  
 Section cross-reference(s): 76  
 AB Microsystems are presented in which a SiON based optical waveguiding  
 system is monolithically integrated with photodiodes, which are  
 implemented in the \*\*\*Si\*\*\* substrate. Coupling structures of various  
 type enable to transfer whether (part of) the power of one selected mode  
 or the power of all modes propagating through the waveguide, to the  
 photodiode. Here we focus on coupling structures for use in integrated  
 optical absorption sensor systems, where information can be obtained from  
 both the TE0 and TM0 mode, propagating simultaneously through the  
 waveguide system. The coupling into the photodiodes is achieved by  
 thinning down the thickness of the core layer in the region above the  
 photodiode, which results in a mode specific mode-width expansion of the  
 propagating modes. It is shown that in asym. layer systems, within a  
 certain interaction length all TM0 power can be absorbed by the \*\*\*Si\*\*\*  
 detector, while the TE0 mode shows only a negligible attenuation. The  
 selectivity of the coupling can be strongly enhanced by implementing an  
 addnl. substrate layer, having a refractive index in between that of the  
 TE0 and TM0 mode. Both theor. and exptl. results will be presented.  
 ST \*\*\*silicon\*\*\* oxy nitride integrated optical waveguide photodiode  
 IT Optical waveguides

(integrated with photodiodes using \*\*\*silicon\*\*\* oxynitride layer)  
 IT \*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
 (of p-n photodiode structure in \*\*\*silicon\*\*\* , and optical  
 integration with waveguides)  
 IT Optical \*\*\*couplers\*\*\*  
 Optical detectors  
 Optical integrated circuits  
 Photodiodes  
 (optical waveguides integrated with photodiodes using \*\*\*silicon\*\*\*  
 oxynitride layer)  
 IT 12355-90-7, Boron fluoride BF21+  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (implantation of photodiode structure in \*\*\*silicon\*\*\* , and optical  
 integration with waveguides)  
 IT 11105-01-4, \*\*\*Silicon\*\*\* oxynitride  
 RL: DEV (Device component use); USES (Uses)  
 (optical waveguides integrated with photodiodes using \*\*\*silicon\*\*\*  
 oxynitride layer)  
 IT 7440-21-3, \*\*\*Silicon\*\*\* , uses  
 RL: DEV (Device component use); USES (Uses)  
 (substrate, photodiode; optical waveguides integrated with photodiodes  
 using \*\*\*silicon\*\*\* oxynitride layer)  
 IT 7631-86-9, Silica, uses  
 RL: DEV (Device component use); USES (Uses)  
 (waveguide cladding; optical waveguides integrated with photodiodes  
 using \*\*\*silicon\*\*\* oxynitride layer)  
 IT 12033-89-5, \*\*\*Silicon\*\*\* nitride Si3N4, uses  
 RL: DEV (Device component use); USES (Uses)  
 (waveguide core; optical waveguides integrated with photodiodes using  
 \*\*\*silicon\*\*\* oxynitride layer)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE

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- (2) Baba, T; Applied Optics 1990, V29(18), P2781 CAPLUS
- (3) Deri, R; Journal of Lightwave Technology 1993, V11(8), P1296 CAPLUS
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L7 ANSWER 40 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1998:740197 CAPLUS

DN 130:8742

ED Entered STN: 23 Nov 1998

TI Spectral characteristics of multilayer cobalt-carbon mirrors for the  
 .lambda. .apprxeq.7.5 nm range

AU Kolachevskii, N. N.; Louis, E.; Spiller, E.; Mitropol'skii, M. M.;  
 Bijkerk, F.; Ragozin, E. N.

CS Fiz. Inst. im. Lebedeva, Ran, RANMoscow, 117924, Russia

SO Kvantovaya Elektronika (Moscow) (1997), 24(8), 731-735

CODEN: KVEKA3; ISSN: 0368-7147

PB Radio i Svyaz

DT Journal

LA Russian

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)

AB Multilayer Co-C mirrors on \*\*\*Si\*\*\* (111) substrates were made by  
 electron-beam deposition and polishing of the metal layers by Kr+  
 \*\*\*ion\*\*\* \*\*\*bombardment\*\*\* . A new spectroscopic method was  
 developed for estg. the parameters of plane multilayer x-ray mirrors by  
 illuminating a sample with broad-band radiation from a laser-plasma source  
 and by subsequent dispersion of this radiation with a diffraction  
 \*\*\*grating\*\*\* operating in the transmission mode.

ST spectral characteristic multilayer cobalt carbon mirror; x ray reflection  
 mirror

IT Vapor deposition process  
 (electron-beam; spectral characteristics of multilayer cobalt-carbon

mirrors for .lambda. .apprxeq.7.5 nm range)

IT X-ray  
(reflection; spectral characteristics of multilayer cobalt-carbon mirrors for .lambda. .apprxeq.7.5 nm range)

IT \*\*\*Ion\*\*\* \*\*\*bombardment\*\*\*

Polishing  
(spectral characteristics of multilayer cobalt-carbon mirrors polishes using argon ions)

IT Mirrors  
(x-ray; spectral characteristics of multilayer cobalt-carbon mirrors for .lambda. .apprxeq.7.5 nm range)

IT 7440-44-0, Carbon, properties 7440-48-4, Cobalt, properties  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(spectral characteristics of multilayer cobalt-carbon mirrors for .lambda. .apprxeq.7.5 nm range)

IT 16915-28-9, Krypton(1+), uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(spectral characteristics of multilayer cobalt-carbon mirrors polishes using argon ions)

L7 ANSWER 41 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1998:738872 CAPLUS  
DN 130:87861  
ED Entered STN: 20 Nov 1998  
TI Experimental performances of implanted lamellar x-ray multilayer  
\*\*\*grating\*\*\* . Comparison with conventional etched multilayer  
\*\*\*grating\*\*\*

AU Trambly, H.; Vidal, B.; Roux, L.  
CS Laboratoire d'Optique Electromagnetique, Greasque, Fr.  
SO Nuclear Instruments & Methods in Physics Research, Section A:  
Accelerators, Spectrometers, Detectors, and Associated Equipment (1998),  
418(2-3), 482-490  
CODEN: NIMAER; ISSN: 0168-9002  
PB Elsevier Science B.V.  
DT Journal  
LA English  
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB An original way is given to perform x-ray diffractive optics based on local intermixing with energetic ions. The valleys of the conventional x-ray multilayer \*\*\*grating\*\*\* are replaced by mixed multilayer parts with low reflectivity. This new structure obtained by \*\*\*ion\*\*\* \*\*\*implantation\*\*\* instead of etching is called implanted multilayer \*\*\*grating\*\*\* . The authors report on diffraction measurements of implanted and etched multilayer \*\*\*grating\*\*\* at the Cu K.alpha. emission line. Comparative studies demonstrate 1st the capability to perform diffractive optics with a new process and 2nd, show similar diffraction efficiencies for both multilayer \*\*\*gratings\*\*\* . The implanted \*\*\*grating\*\*\* , which keeps a bulk structure after irradiation, has therefore a better resistance to mech. stresses. Addnl. it allows one to perform new optics, using a superposition of several plane diffractive structures.

ST x ray diffraction \*\*\*grating\*\*\* tungsten \*\*\*silicon\*\*\* multilayer oxygen implantation

IT Ion beams  
\*\*\*Ion\*\*\* \*\*\*implantation\*\*\*

Multilayers  
(exptl. performance of oxygen- \*\*\*ion\*\*\* \*\*\*implanted\*\*\* lamellar tungsten/ \*\*\*silicon\*\*\* x-ray multilayer \*\*\*grating\*\*\* )

IT Diffraction \*\*\*gratings\*\*\*  
(x-ray, multilayer; exptl. performance of oxygen- \*\*\*ion\*\*\* \*\*\*implanted\*\*\* lamellar tungsten/ \*\*\*silicon\*\*\* x-ray multilayer \*\*\*grating\*\*\* )

IT 14581-93-2, Oxygen 1+, uses  
RL: DEV (Device component use); MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(exptl. performance of oxygen- \*\*\*ion\*\*\* \*\*\*implanted\*\*\* lamellar tungsten/ \*\*\*silicon\*\*\* x-ray multilayer \*\*\*grating\*\*\* )

IT 7440-21-3, \*\*\*Silicon\*\*\* , uses 7440-33-7, Tungsten, uses  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(exptl. performance of oxygen- \*\*\*ion\*\*\* \*\*\*implanted\*\*\*

lamellar tungsten/ \*\*\*silicon\*\*\* x-ray multilayer \*\*\*grating\*\*\* )  
IT 7440-02-0, Nickel, uses 9011-14-7, PMMA  
RL: NUJ (Other use, unclassified); USES (Uses)  
(exptl. performance of oxygen- \*\*\*ion\*\*\* \*\*\*implanted\*\*\*  
lamellar tungsten/ \*\*\*silicon\*\*\* x-ray multilayer \*\*\*grating\*\*\* )  
RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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(25) Yoneda, Y; Phys Rev 1963, V131, P2010  
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L7 ANSWER 42 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1998-733645 CAPLUS  
DN 130:31619  
ED Entered STN: 19 Nov 1998  
TI The dynamics of recrystallization and melting of implanted \*\*\*silicon\*\*\*  
at irradiation by powerful light pulses  
AU Fattakhov, Ya V.; Galyautdinov, M. F.; L'vova, T. N.; Khaibullin, I. B.  
CS Kazan Physical-Technical Institute of the Russian Academy of Sciences,  
Kazan, 420029, Russia  
SO Vacuum (1998), 51(2), 255-259  
CODEN: VACUAV; ISSN: 0042-207X  
PB Elsevier Science Ltd.  
DT Journal  
LA English  
CC 76-3 (Electric Phenomena)  
Section cross-reference(s): 75  
AB One of the effects obsd. in the irradiation of semiconductors by powerful  
pulses of coherent and incoherent light sources in the range of durations  
from 0.2 ms to 10 s is the effect of anisotropic local melting. It allows  
valuable phys. information on semiconductor properties and processes  
occurring in the sample during and after pulse irradiation to be obtained.  
Here the dynamics of anisotropic local melting of implanted  
\*\*\*silicon\*\*\* for different regimes of light pulses was studied. The  
nucleation and growth of local regions of melting (LRM) during the light  
irradiation was detected by a high-speed camera. The time dependencies of the  
quantity and sizes of LRMs were dynamically obsd. for the 1st time.  
Diffraction \*\*\*gratings\*\*\* were formed using \*\*\*ion\*\*\*  
\*\*\*implantation\*\*\* and the effect of local melting. The dynamics of  
diffraction during and after the light pulse irradiation were studied. The  
results allow the specification of the mechanism of the effect of  
anisotropic local melting, and the optimization of the regimes of pulse  
annealing of implanted semiconductors and the regimes of formation of  
submicron dopant layers by rapid thermal diffusion from spin-on sources.  
ST laser recrystn \*\*\*silicon\*\*\* semiconductor  
IT Annealing  
Diffusion  
\*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
Laser radiation

Recrystallization  
Semiconductor materials  
(dynamics of recrystn. and melting of implanted \*\*\*silicon\*\*\* at  
irradn. by powerful light pulses)

IT 7440-21-3, \*\*\*Silicon\*\*\*, properties  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM  
(Technical or engineered material use); PROC (Process); USES (Uses)  
(dynamics of recrystn. and melting of implanted \*\*\*silicon\*\*\* at  
irradn. by powerful light pulses)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

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P142  
(2) Celler, G; Applied Physics Letters 1983, V43, P868 CAPLUS  
(3) Emel'yanov, V; Laser Physics 1992, V2, P389  
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V59/60, P1072  
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Russian) 1995, V59, PN12  
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Materials 1985, P265  
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CAPLUS  
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L7 ANSWER 43 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1998:680143 CAPLUS  
DN 130:9329  
ED Entered STN: 28 Oct 1998  
TI Direct micropatterning of \*\*\*Si\*\*\* and GaAs using electrochemical  
development of focused \*\*\*ion\*\*\* beam \*\*\*implants\*\*\*  
AU Schmuki, P.; Erickson, L. E.  
CS Department of Materials Science, Swiss Federal Institute of Technology  
(ETH/EPFL), LC-DMX, Lausanne, CH-1015, Switz.  
SO Applied Physics Letters (1998), 73(18), 2600-2602  
CODEN: APPLAB; ISSN: 0003-6951  
PB American Institute of Physics  
DT Journal  
LA English  
CC 76-3 (Electric Phenomena)  
AB Focused- \*\*\*ion\*\*\* -beam \*\*\*implantation\*\*\* of Si<sup>2+</sup> was used to  
write defined surface damage/implant patterns into n-type GaAs (100) and  
\*\*\*Si\*\*\* (100) substrates. These implant sites represent initiation  
sites for dissoln. processes when electrochem. polarized in HCl or HF  
electrolytes, resp. Selective dissoln. within the patterns is achieved if  
anodic polarization of the n-type material is carried out in the dark at  
potentials below (cathodic to) the onset of dissoln. potential of the  
unimplanted surface. Uniform etching within the implanted region takes  
place when local electropolishing conditions are established. Thus,  
highly defined etch patterns, e.g., lines, \*\*\*gratings\*\*\*, or pits,  
can be produced in the submicron range. The depth of the etched patterns  
corresponds to the implant/damage profile created in the implantation  
process, and etch stop occurs at less reactive crystal planes.

ST \*\*\*silicon\*\*\* micropatterning electrochem \*\*\*ion\*\*\*  
\*\*\*implantation\*\*\*; gallium arsenide micropatterning electrochem  
\*\*\*ion\*\*\* \*\*\*implantation\*\*\*

IT Electrochemistry  
(direct micropatterning of \*\*\*Si\*\*\* and GaAs using electrochem.  
development of focused- \*\*\*ion\*\*\* -beam \*\*\*implants\*\*\* )

IT 14175-55-4, \*\*\*Silicon\*\*\* (2+), uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(direct micropatterning of \*\*\*Si\*\*\* and GaAs using electrochem.  
development of focused- \*\*\*ion\*\*\* -beam \*\*\*implants\*\*\* )

IT 1303-00-0, Gallium arsenide, processes 7440-21-3, \*\*\*Silicon\*\*\*,  
processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(direct micropatterning of \*\*\*Si\*\*\* and GaAs using electrochem.  
development of focused- \*\*\*ion\*\*\* -beam \*\*\*implants\*\*\* )

RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

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L7 ANSWER 44 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1998:469457 CAPLUS

DN 129:238176

ED Entered STN: 29 Jul 1998

TI The dynamics of anisotropic local melting of semiconductors at irradiation by powerful light pulses

AU Fattakhov, Ya. V.; Galyautdinov, M. F.; L'vova, T. N.; Khaibullin, I. B.  
CS Kazan Physical-Technical Institute of the Russian Academy of Sciences, Kazan, 420029, Russia

SO Proceedings of the International Conference on Lasers (1998), Volume Date 1997, 20th, 440-445  
CODEN: PICLDV; ISSN: 0190-4132

PB STS Press

DT Journal

LA English

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 73

AB In this work, the dynamics of anisotropic local melting of single-crystal and implanted \*\*\*silicon\*\*\* at different regimes of light pulse irradiation was investigated using several optical methods. In particular, the special diffraction \*\*\*gratings\*\*\* were formed on the \*\*\*silicon\*\*\* surface using \*\*\*ion\*\*\* \*\*\*implantation\*\*\* and effect of local melting. The diffraction picture was obsd. at illumination of such a \*\*\*grating\*\*\* by continual irradiation by a He-Ne laser. The intensity of the diffraction picture depends on the contrast of this periodical structure, i.e. from the difference of cryst. and phase conditions of the substance of \*\*\*gratings\*\*\* fragments. The dynamics of diffraction effectivity during and after the power light pulse was registered using a high-speed camera or photomultiplier. It is possible to note three qual. stages. On the first stage, the decrease of diffraction effectivity and its full disappearance take place as heating of the sample with diffraction \*\*\*grating\*\*\*. This means that the recrystn. of the amorphous layer is finished. On the second stage, the diffraction picture arises again when the temp. of the sample with the \*\*\*grating\*\*\* reaches the temp. of local melting. In this case, the local melting begins on "amorphized" cells of diffraction \*\*\*grating\*\*\*. The diffraction effectivity increases as the area of molten \*\*\*silicon\*\*\* increases up to full melting of the implanted cell. The arising of microrelief on the surface of molten regions give the essential contribution in increasing the diffraction effectivity, i.e. takes place the transformation of amplitude \*\*\*grating\*\*\* in the phase \*\*\*grating\*\*\*. On the third stage, a small decrease of diffraction effectivity was obsd. after switching off the light pulse, cooling of the sample, and recrystn. of local molten regions. Thus, it is possible to det. from this expt. the parameters which are necessary to develop the phys. model of the effect and to understand the features of phase transitions during light irradiation.

ST laser irradiation semiconductor melting

IT Laser radiation

Melting

Semiconductor materials

(dynamics of anisotropic local melting of semiconductors during irradiation by powerful light pulses)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE  
(1) Celler, G; Appl Phys Lett 1983, V43(9), P868 CAPLUS  
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(4) Ya, V; Proc of the International Conference "Lasers ` 95" 1996, P586

L7 ANSWER 45 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1998:347846 CAPLUS  
DN 129:142383  
ED Entered STN: 10 Jun 1998  
TI Optimization of CCD fabrication process for space application  
AU Aslam, S.; Das, N. C.; Jhabvala, M.; Shu, P.  
CS Hughes/STX Corp., Lanham, MD, 20706, USA  
SO Proceedings of SPIE-The International Society for Optical Engineering (1998), 3316(Physics of Semiconductor Devices, Vol. 1), 588-591  
CODEN: PSISDG; ISSN: 0277-786X  
PB SPIE-The International Society for Optical Engineering  
DT Journal  
LA English  
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB There exists a need to design small spectrometers for space sensor applications. Designing a small spectrometer requires a detector array with narrow pixels to meet the smaller \*\*\*grating\*\*\* periodicity. At Goddard Space Flight Center, an interleaved 512 pixel linear array with 200 .mu.m .times. 6 .mu.m pinned photodiode (PD) sensing sites and 500 .mu.m .times. 20 .mu.m CCD readout resistors have been designed and fabricated. Challenges arising in the design and processing of this detector are assocd. with the full well capacity of the odd shaped photodiode, and with the efficiency of charge transfer from photodiode to CCD storage area. By optimizing pinning implant process in PD area and using suitable transfer gate voltages the desired PD signal level of 6 Me-1 was achieved.

ST \*\*\*silicon\*\*\* CCD optical detector space application  
IT Charge coupled devices  
\*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
Optical detectors  
Space vehicles  
(CCD photodetector fabrication process for space application)

IT 7440-21-3, \*\*\*Silicon\*\*\* , uses 7631-86-9, Silica, uses 12033-89-5, \*\*\*Silicon\*\*\* nitride, uses  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(CCD photodetector fabrication process for space application)

IT 7440-42-8, Boron, processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
( \*\*\*ion\*\*\* \*\*\*implantation\*\*\* ; CCD photodetector fabrication process for space application)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE  
(1) Banghart, E; IEEE Trans 1991, VED-38, P1162  
(2) Burkey, B; Proc of IEDM 1984, P28  
(3) Geary, J; Proc SPIE Conf on CCD and Solid state sensors 1990, P38  
(4) Janesick, J; Optical sensors and electronic photography 1989, V1071  
(5) Kuriyama, T; IEEE Electron Device 1991, VED-38, P949

L7 ANSWER 46 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1998:190374 CAPLUS  
DN 128:198494  
ED Entered STN: 01 Apr 1998  
TI Development and characterization of electronic devices based on single crystalline CoSi2/ \*\*\*Si\*\*\* (100) heterostructures and sub-micron patterning of CoSi2-layers on \*\*\*silicon\*\*\*  
AU Dolle, Martin  
CS Inst. Schicht- Ionentechnik, Forschungszentrum Juelich G.m.b.H., Juelich, D-52425, Germany  
SO Berichte des Forschungszentrums Juelich (1997), Juel-3446, 1-117 pp.  
CODEN: FJBEE5; ISSN: 0366-0885  
DT Report  
LA German  
CC 73-12 (Optical, Electron, and Mass Spectroscopy and Other Related



Properties)  
 Section cross-reference(s): 74, 76

AB The fabrication process of a LED array with porous \*\*\*Si\*\*\* (PS) was investigated. The fundamental idea was to control the electroluminescence (EL) of a continuous PS layer locally by an array of vertical metal-semiconductor field-effect transistors (MESFETs) based on single cryst. \*\*\*Si\*\*\* /CoSi2/ \*\*\*Si\*\*\* (100) heterostructures. The LED array consists of 2 crossed stripe- \*\*\*gratings\*\*\* buried in a \*\*\*Si\*\*\* substrate with a continuous PS layer on top. One \*\*\*grating\*\*\* acts as source-, the other one as gate- and the PS layer as drain-electrode of the transistor. SIMS and channeling measurements have shown that highly conducting source- \*\*\*gratings\*\*\* in intrinsic \*\*\*Si\*\*\* substrate can be fabricated by implantation of P through a SiO2 mask. The gate- \*\*\*grating\*\*\* was fabricated by \*\*\*implantation\*\*\* of Co \*\*\*ions\*\*\* through a mask perpendicular to the source-stripe- \*\*\*grating\*\*\* and subsequent annealing (ion beam synthesis, IBS). The current-voltage characteristic of the source and gate-electrode have proven the compatibility of P implantation and IBS of CoSi2. The compatibility of IBS with the electrolytic formation of PS was demonstrated by the obsd. EL of PS on buried CoSi2 layers. In addn., a novel patterning method for single cryst. CoSi2 layers on \*\*\*Si\*\*\* based on local oxidn. of the silicide was developed and optimized. The local oxidn. of thin CoSi2 layers was investigated in detail. A strong dependence of the patterning process on the silicide layer thickness as well as on the orientation of the oxidn. mask was obsd. The new process allows the patterning of 100 nm wide gaps between two metallic contacts by use of std. optical lithog.

ST porous \*\*\*silicon\*\*\* cobalt silicide LED fabrication; lithog patterning MESFET cobalt silicide oxidn; electroluminescence cobalt silicide porous \*\*\*silicon\*\*\* LED; elec property cobalt silicide \*\*\*silicon\*\*\* LED

IT Electroluminescent devices  
 Luminescence, electroluminescence  
 MESFET (transistors)  
 Semiconductor device fabrication  
 (fabrication and characterization of LEDs based on porous \*\*\*Si\*\*\* and single cryst. CoSi2/ \*\*\*Si\*\*\* (100) MESFETs and submicron oxidative patterning of CoSi2 layers on \*\*\*Si\*\*\* )

IT Electric resistance  
 (of CoSi2 in CoSi2/ \*\*\*Si\*\*\* (100) heterostructures of MESFETs used for LED arrays)

IT Oxidation kinetics  
 (of CoSi2/ \*\*\*Si\*\*\* (100) heterostructures in MESFETs used for LED arrays)

IT Schottky barrier  
 (oxidn. effect on Schottky barrier in CoSi2/ \*\*\*Si\*\*\* (100) heterostructures of MESFETs used for LED arrays)

IT Oxidation  
 Photolithography  
 (submicron oxidative patterning by optical lithog of CoSi2 layers on \*\*\*Si\*\*\* in MESFETs used for LED arrays)

IT 16427-80-8, Phosphorus1+, processes  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (P+ implantation in \*\*\*Si\*\*\* (100) of CoSi2/ \*\*\*Si\*\*\* (100) MESFETs for LED arrays)

IT 7723-14-0, Phosphorus, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (dopant; in \*\*\*Si\*\*\* (100) of CoSi2/ \*\*\*Si\*\*\* (100) MESFETs for LED arrays)

IT 7440-21-3, \*\*\*Silicon\*\*\*, properties 12017-12-8, Cobalt disilicide  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)  
 (fabrication and characterization of LEDs based on porous \*\*\*Si\*\*\* and single cryst. CoSi2/ \*\*\*Si\*\*\* (100) MESFETs and submicron oxidative patterning of CoSi2 layers on \*\*\*Si\*\*\* )

IT 16610-75-6, Cobalt1+, processes  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (implantation in \*\*\*Si\*\*\* (100) for fabrication of CoSi2/ \*\*\*Si\*\*\* (100) MESFETs used for LED arrays)

DN 127:128642  
 ED Entered STN: 16 Jun 1997  
 TI Photosensitivity of B, \*\*\*Si\*\*\* and N implanted silica  
 AU Magruder, R. H., III; Zuhr, R. A.; Hensley, D. K.; Withrow, S.  
 CS Dept. of Physics, Belmont University, Nashville, TN, 37212, USA  
 SO Nuclear Instruments & Methods in Physics Research, Section B: Beam  
 Interactions with Materials and Atoms (1997), 127/128, 492-496  
 CODEN: NIMBEU; ISSN: 0168-583X  
 PB Elsevier  
 DT Journal  
 LA English  
 CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 AB Silica was \*\*\*implanted\*\*\* with B and N \*\*\*ions\*\*\* at 4 MeV and  
 \*\*\*Si\*\*\* ions at 5 MeV with nominal doses of 1.times.10<sup>16</sup> ions/cm<sup>2</sup>. The  
 samples were exposed to 245 nm KrF excimer irradiation with a fluence of 150  
 mJ/cm<sup>2</sup> per pulse for pulse totals of 1.5, 15 and 30 J/cm<sup>2</sup>. The optical  
 absorption from 200 to 450 nm was measured before and after each series of  
 KrF irradiations. Broad peaks at 210 and 245 nm are observed in the  
 absorption spectra. The magnitude of the absorption as well as the  
 photosensitive response is dependent on the \*\*\*implanted\*\*\*  
 \*\*\*ion\*\*\* species. We attribute the differences observed in the absorption  
 of the as implanted samples and their response to KrF irradiation to  
 differences in the ion-solid interactions.  
 ST photosensitivity \*\*\*ion\*\*\* \*\*\*implantation\*\*\* silica multiple  
 defect; boron \*\*\*ion\*\*\* \*\*\*implant\*\*\* silica photosensitive  
 response; \*\*\*silicon\*\*\* \*\*\*ion\*\*\* \*\*\*implant\*\*\* silica  
 photorefractive \*\*\*grating\*\*\*; nitrogen \*\*\*ion\*\*\* \*\*\*implant\*\*\*  
 silica refractive index  
 IT Defects in solids  
 Diffraction \*\*\*gratings\*\*\*  
 \*\*\*Implanted\*\*\* \*\*\*ions\*\*\*  
 \*\*\*Ion\*\*\* \*\*\*implantation\*\*\*  
 Photorefractive materials  
 Surface photolysis  
 UV and visible spectra  
 (photosensitivity of B, \*\*\*Si\*\*\* and N implanted silica explained  
 in terms of multiple defects)  
 IT 7440-21-3D, \*\*\*Silicon\*\*\*, ion, uses 7440-42-8D, Boron, ion, uses  
 17778-88-0D, Atomic nitrogen, ion, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (photosensitivity of B, \*\*\*Si\*\*\* and N implanted silica explained  
 in terms of multiple defects)  
 IT 7631-86-9, Silica, properties  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
 PROC (Process)  
 (photosensitivity of B, \*\*\*Si\*\*\* and N implanted silica explained  
 in terms of multiple defects)  
 RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE  
 (1) Albert, J; Appl Phys Lett 1992, V60, P148 CAPLUS  
 (2) Antonini, M; Rad Effects 1982, V65, P41 CAPLUS  
 (3) Arnold, G; IEEE Trans Nucl Sci 1973, VNS-20, P220  
 (4) Arnold, G; Mater Res Soc Symp 1990, V157, P569 CAPLUS  
 (5) Friebele, E; Diffusion and Defect Data 1987, V53-54, P202  
 (6) Hill, K; Annu Rev Mater Sci 1993, V23, P125 CAPLUS  
 (7) Hosono, H; Phys Rev B 1992, V46, P11445 CAPLUS  
 (8) Imai, H; Phys Rev B 1988, V38, P12772 CAPLUS  
 (9) Leech, P; Nucl Inst and Meth B 1995, V106, P442 CAPLUS  
 (10) Magruder, R; J Non-Cryst Solids 1993, V159, P269  
 (11) Magruder, R; Proc SPIE 1990, V1327, P50 CAPLUS  
 (12) Tohmon, R; Phys Rev B 1989, V39, P1337 CAPLUS  
 (13) Townsend, P; Optical Effects of Ion Implantation 1994  
 (14) Webb, A; J Phys D 1976, V9, P1343 CAPLUS  
 (15) Weeks, R; J Non-Cryst Solids 1992, V149, P122 CAPLUS  
 L7 ANSWER 48 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1996:568079 CAPLUS  
 DN 125:288561  
 ED Entered STN: 24 Sep 1996  
 TI Atomic force microscopy of laser induced sub-micrometer periodic  
 structures on implanted fused silica and \*\*\*silicon\*\*\*

AU Bukharaev, A. A.; Janduganov, V. M.; Samarsky, E. A.; Berdunov, N. V.  
 CS Kazan Physical-Technical Institute of the Russian Academy of Sciences,  
 Sibirsky Trakt 10/7, Kazan, Tatarstan, 420029, Russia  
 SO Applied Surface Science (1996), 103(1), 49-54  
 CODEN: ASUSEE; ISSN: 0169-4332  
 PB Elsevier  
 DT Journal  
 LA English  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 AB The ultrathin layers with depth from 30 to 60 nm and optical absorption  
 coeff. up to 105 cm<sup>-1</sup> were created on the fused silica and cryst.  
 \*\*\*silicon\*\*\* surfaces by Fe and Sb \*\*\*ions\*\*\* \*\*\*bombardment\*\*\*  
 resp. Nanometer-scale .alpha.-Fe particles formed into glass surface  
 layer by high dose Fe+ bombardment were responsible for optical absorption  
 in the Fe+ implanted fused silica. The increase in the optical absorption  
 of \*\*\*Si\*\*\* after Sb+ implantation are due to transformation of the  
 \*\*\*silicon\*\*\* surface layer from the cryst. to the amorphous state.  
 These layers were found to be easily evapd. by pulsed beam of UV and  
 visible lasers due to their high light absorption. Such materials may be  
 promising in manufg. the video disk master. The sub-micrometer  
 diffraction \*\*\*gratings\*\*\* were produced using holog. method in order  
 to est. the possible resoln. of these media for optical data storage. It  
 was found with At. Force Microscope (AFM) that microtopog. of  
 laser-induced diffraction \*\*\*gratings\*\*\* is detd. by the size of  
 optical absorption centers. After treatment with higher laser power d.  
 the half-micrometer bi-directional diffraction \*\*\*gratings\*\*\* on  
 implanted \*\*\*silicon\*\*\* were obsd. by AFM. The origin of these  
 \*\*\*gratings\*\*\* was explained in terms of the laser-induced surface  
 electromagnetic waves.  
 ST atomic force microscope laser modification \*\*\*silicon\*\*\* ; silica  
 surface modification laser microstructure periodic; optical data storage  
 \*\*\*silicon\*\*\* \*\*\*ion\*\*\* \*\*\*bombardment\*\*\*  
 IT Laser radiation  
 (at. force microscopy of laser induced sub-micrometer periodic  
 structures on implanted fused silica and \*\*\*silicon\*\*\* surface)  
 IT Diffraction \*\*\*gratings\*\*\*  
 (laser induced sub-micrometer periodic structures on implanted fused  
 silica and \*\*\*silicon\*\*\* surface in relation to)  
 IT Microscopes  
 (at.-force, laser induced sub-micrometer periodic structures on  
 implanted fused silica and \*\*\*silicon\*\*\* surface)  
 IT Memory devices  
 Recording materials  
 (optical, laser induced sub-micrometer periodic structures on implanted  
 fused silica and \*\*\*silicon\*\*\* surface in relation to)  
 IT 7439-89-6, Iron, formation (nonpreparative)  
 RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
 (at. force microscopy of laser induced sub-micrometer periodic  
 structures on Fe1+ implanted fused silica)  
 IT 14067-02-8, Iron(1+), processes  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (at. force microscopy of laser induced sub-micrometer periodic  
 structures on Fe1+ implanted fused silica)  
 IT 22679-96-5, Antimony(1+), processes  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (at. force microscopy of laser induced sub-micrometer periodic  
 structures on Sb1+ implanted fused silica)  
 IT 7440-21-3, \*\*\*Silicon\*\*\*, processes 60676-86-0, Fused silica  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (at. force microscopy of laser induced sub-micrometer periodic  
 structures on implanted fused silica and \*\*\*silicon\*\*\* surface)  
 L7 ANSWER 49 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1996:533386 CAPLUS  
 DN 125:288443  
 ED Entered STN: 06 Sep 1996  
 TI From processing of cosmic ices to optical communications  
 AU Brown, Walter L.  
 CS AT and T Bell Laboratories, Murray Hill, NJ, 07974-0636, USA  
 SO Nuclear Instruments & Methods in Physics Research, Section B: Beam  
 Interactions with Materials and Atoms (1996), 116(1-4), 1-12

CODEN: NIMBEU; ISSN: 0168-583X

PB Elsevier

DT Journal; General Review

LA English

CC 74-0 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 73

AB In the low temps. of space, frozen layers of water, ammonia and methane are subject to chem. and phys. alteration by \*\*\*bombardment\*\*\* with energetic \*\*\*ions\*\*\*, electrons and photons. In the lithog. definition of submicron \*\*\*silicon\*\*\* integrated circuits, the optical elements of the lithog. system are damaged by light at high intensities. In glass fiber communication systems optical \*\*\*grating\*\*\* for wavelength selectivity can be formed by UV irradiation. This small subset of radiation effects in insulators is discussed as illustrative of the range of influence of this field in current science and technology. A review with 17 refs.

ST review radiation effect insulator material; radiation effect frozen water space review; insulating hydrocarbon film radiation effect review; lithog resist \*\*\*silicon\*\*\* radiation effect review; optical fiber communication radiation effect review

IT Ice  
(radiation effects in frozen layers of water, ammonia and methane in low temps. of space)

IT Hydrocarbons, properties  
RL: PRP (Properties)  
(radiation effects in insulating films formed by condensation of hydrocarbon mols. on cold surface)

IT Electric insulators and Dielectrics  
Radiation  
Radiolysis  
(radiation effects in insulators and material changes associated with it)

IT Photolysis  
(radiation effects in lithog. resist materials used in \*\*\*silicon\*\*\* integrated circuit industry)

IT Optical fibers  
(radiation induced changes in optical properties of fibers used in optical communications)

IT Desorption  
(photo-, radiation effects in frozen layers of water, ammonia and methane in low temps. of space)

IT Lithography  
(photo-, UV, radiation effects in lithog. resist materials used in \*\*\*silicon\*\*\* integrated circuit industry)

L7 ANSWER 50 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1996:522555 CAPLUS

DN 125:260624

ED Entered STN: 30 Aug 1996

TI Optically induced GeO<sub>2</sub>-SiO<sub>2</sub> fiber \*\*\*gratings\*\*\* (formation mechanism and new application)

AU Nishii, Junji; Hosono, Hideo

CS Osaka National Research Institute, Japan

SO Optonics (1996), 176, 142-148

CODEN: OPUTDD; ISSN: 0286-9659

PB Optronikusha

DT Journal

LA Japanese

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 74, 75, 77

AB UV induced photochem. reactions in GeO<sub>2</sub>-SiO<sub>2</sub> glasses were closely related with the formation of Bragg \*\*\*gratings\*\*\*. Two kinds of color centers were formed depending on the power density of UV light sources: Ge<sup>+</sup> center by irradiation with UV lamp (1-photon absorption) and Ge electron trapped center (GEC) induced by the excimer laser irradiation (two-photon absorption). The precursors of the former and the latter were an oxygen deficient defect causing an absorption band at 5 eV and the 4-fold-coordinated Ge. Photon-induced property changes in GeO<sub>2</sub>-SiO<sub>2</sub> glasses prepared by \*\*\*ion\*\*\* \*\*\*implantation\*\*\* and sputtering methods were also described.

ST germanium oxide silica fiber \*\*\*grating\*\*\*; laser induced germanium

silicate fiber \*\*\*grating\*\*\* ; UV laser induced fiber \*\*\*grating\*\*\*  
; electron trap center germanium \*\*\*silicon\*\*\* oxide  
IT Electron spin resonance  
(ESR of optically induced GeO<sub>2</sub>-SiO<sub>2</sub> fiber \*\*\*gratings\*\*\* )  
IT Color centers  
(E', optically induced GeO<sub>2</sub>-SiO<sub>2</sub> fiber \*\*\*gratings\*\*\* and color  
center formation)  
IT Laser radiation  
(UV, optically induced GeO<sub>2</sub>-SiO<sub>2</sub> fiber \*\*\*gratings\*\*\* )  
IT Glass, oxide  
RL: DEV (Device component use); PEP (Physical, engineering or chemical  
process); PRP (Properties); PROC (Process); USES (Uses)  
(germanium silicate, optically induced GeO<sub>2</sub>-SiO<sub>2</sub> fiber \*\*\*gratings\*\*\*  
)  
IT \*\*\*Ions\*\*\* in solids  
( \*\*\*implanted\*\*\* , UV induced photochem. changes in \*\*\*ion\*\*\*  
\*\*\*implanted\*\*\* GeO<sub>2</sub>-SiO<sub>2</sub> fiber \*\*\*gratings\*\*\* )  
IT Diffraction \*\*\*gratings\*\*\*  
(laser-induced, optically induced GeO<sub>2</sub>-SiO<sub>2</sub> fiber \*\*\*gratings\*\*\* )  
IT Optical absorption  
(two-photon, UV laser induced GeO<sub>2</sub>-SiO<sub>2</sub> fiber \*\*\*gratings\*\*\* )  
IT 1310-53-8, Germanium oxide (GeO<sub>2</sub>), properties 7631-86-9, \*\*\*Silicon\*\*\*  
oxide (SiO<sub>2</sub>), properties  
RL: DEV (Device component use); PEP (Physical, engineering or chemical  
process); PRP (Properties); PROC (Process); USES (Uses)  
(optically induced GeO<sub>2</sub>-SiO<sub>2</sub> fiber \*\*\*gratings\*\*\* )

L7 ANSWER 51 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1996:424168 CAPLUS  
DN 125:128657  
ED Entered STN: 18 Jul 1996  
TI Imagings of picosecond-photoexcited carriers and enhanced Auger  
recombination rate by transient reflecting \*\*\*grating\*\*\* measurements  
AU Tanaka, Takayuki; Harata, Akira; Sawada, Tsuguo  
CS Dep. Applied Chem., Univ. Tokyo, Tokyo, 113, Japan  
SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes &  
Review Papers (1996), 35(6A), 3642-3647  
CODEN: JAPNDE; ISSN: 0021-4922  
PB Japanese Journal of Applied Physics  
DT Journal  
LA English  
CC 76-1 (Electric Phenomena)  
AB Photoinduced dynamic processes at a \*\*\*silicon\*\*\* surface were  
investigated by time-resolved measurements of a transient reflecting  
\*\*\*grating\*\*\* with 532 nm excitation and detection. The signal caused  
by photoexcited carriers was sepd. from signals due to thermal and  
acoustic effects. The carrier signal was found to be more sensitive to  
ion induced damages than the thermal and acoustic effect signal. Use of  
the carrier signal provided an inplane distribution image of near surface  
damage induced by helium \*\*\*ion\*\*\* \*\*\*implantation\*\*\* (energy, 200  
keV; dose, 1015 atoms/cm<sup>2</sup>). The cause of the contrast formation was found  
to be the change of Auger recombination rate .gamma.3. The obtained  
.gamma.3 for intrinsic \*\*\*silicon\*\*\* was 4.0 .times. 10<sup>-29</sup> cm<sup>6</sup>/s which  
was two orders of magnitude larger than the bulk value. The results  
indicated defects near the surface region (.apprx.100 nm) accelerated  
.gamma.3.

ST \*\*\*silicon\*\*\* surface photoinduced dynamic process; Auger  
recombination transient reflecting \*\*\*grating\*\*\*  
IT Carriers  
Surface  
(imagings of picosecond-photoexcited carriers and enhanced Auger  
recombination rate by transient reflecting \*\*\*grating\*\*\*  
measurements)  
IT Recombination of electron with hole  
(Auger, imagings of picosecond-photoexcited carriers and enhanced Auger  
recombination rate by transient reflecting \*\*\*grating\*\*\*  
measurements)  
IT 7440-21-3, \*\*\*Silicon\*\*\* , properties  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(imagings of picosecond-photoexcited carriers and enhanced Auger  
recombination rate by transient reflecting \*\*\*grating\*\*\*

L7 ANSWER 52 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1996:400061 CAPLUS  
DN 125:128774  
ED Entered STN: 11 Jul 1996  
TI Improved a-Si1-xGex:H of large x deposited by PECVD  
AU Wickboldt, Paul; Pang, Dawen; Paul, William; Chen, Joseph H.; Zhong, Fan;  
Cohen, J. David; Chen, Yan; Williamson, Don L.  
CS Division of Applied Sciences, Harvard University, 9 Oxford Street,  
Cambridge, MA, 02138, USA  
SO Journal of Non-Crystalline Solids (1996), 198-200(Pt. 1, Amorphous  
Semiconductors: Science and Technology, Pt. 1), 567-571  
CODEN: JNCSBJ; ISSN: 0022-3093  
PB Elsevier  
DT Journal  
LA English  
CC 76-2 (Electric Phenomena)  
Section cross-reference(s): 75  
AB By plasma enhanced CVD a-Si1-xGex:H thin films of large x were prepd.  
which possess optical, elec. and structural properties that are greatly  
improved over any yet reported. This work extends the authors' previous  
work on improving the properties of a-Ge:H [W.A. Turner et al., J. Appl.  
Phys. 67 (1990) 7430]. Steady-state photocond. measurements yield an  
.eta..mu..tau. of (1 to 3).times.10-7 cm2 V-1 for  
1.00.gtoreq.x.gtoreq.0.75 and (6 to 10).times.10-8 cm2 V-1 for  
0.75.gtoreq.x.gtoreq.0.50. Photocurrent \*\*\*grating\*\*\* measurements  
yield an ambipolar diffusion length much greater than previously obtained  
for alloys of large x. The electronic state defect d., as detd. by drive  
level capacitance measurements, decreases from 5.3 .times. 1016 cm-3 for x  
= 1.00 to 6.5 .times. 1015 cm-3 for x = 0.57. The Urbach parameter, E0,  
is 41 .+- . 2 meV for a-Ge:H and 45 .+- . 2 meV for the alloys. Small angle  
x-ray scattering measurements reveal a structure that is nearly as  
homogeneous as device quality a- \*\*\*Si\*\*\* :H. Much of the improvement  
in electronic and optical properties is assocd. with the redn. of  
heterogeneities in the structure. The elimination of columnar structure  
is attributed to increased \*\*\*ion\*\*\* \*\*\*bombardment\*\*\* during  
growth and conditions which yield a high electron temp. in the discharge  
plasma, resulting in favorable discharge chem.  
ST \*\*\*silicon\*\*\* germanium amorphous hydrogenated plasma CVD; defect  
density amorphous hydrogenated \*\*\*silicon\*\*\* germanium; photocond  
amorphous hydrogenated \*\*\*silicon\*\*\* germanium  
IT Semiconductor materials  
(improved a-Si1-xGex:H of large x deposited by PECVD)  
IT Energy level  
(electronic, defect d.; in a-Si1-xGex:H of large x deposited by PECVD)  
IT Vapor deposition processes  
(plasma, improved a-Si1-xGex:H of large x deposited by PECVD)  
IT 11148-21-3P  
RL: PNU (Preparation, unclassified); TEM (Technical or engineered material  
use); PREP (Preparation); USES (Uses)  
(amorphous, hydrogenated; improved a-Si1-xGex:H of large x deposited by  
PECVD)

L7 ANSWER 53 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1996:37355 CAPLUS  
DN 124:131311  
ED Entered STN: 18 Jan 1996  
TI Fabrication of a variable diffraction efficiency phase mask by multiple  
dose \*\*\*ion\*\*\* \*\*\*implantation\*\*\*  
AU Erickson, L. E.; Champion, H. G.; Albert, J.; Hill, K. O.; Malo, B.;  
Theriault, S.; Bilodeau, F.; Johnson, D. C.  
CS Inst. Microstructural Sci., Natl. Res. Council, Ottawa, ON, K1A 0R8, Can.  
SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer  
Structures (1995), 13(6), 2940-3  
CODEN: JVTBD9; ISSN: 0734-211X  
PB American Institute of Physics  
DT Journal  
LA English  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other  
Reprographic Processes)  
AB Apodized fiber Bragg \*\*\*gratings\*\*\* show redns. in the unwanted

sidebands from those of uniform Bragg \*\*\*grating\*\*\* . A phase mask whose diffraction efficiency varied from the center to the ends was fabricated by implanting a \*\*\*grating\*\*\* pattern in a SiO<sub>2</sub> substrate with \*\*\*Si\*\*\* ++ and wet etching in dild. HF. The phase mask diffraction efficiency vs. ion dose was measured. Using this phase mask, apodized Bragg \*\*\*gratings\*\*\* were photo-imprinted into fibers. The sidebands of the apodized fiber \*\*\*gratings\*\*\* were 26 dB below the peak of the central resonance compared to 12 dB for the uniform Bragg \*\*\*grating\*\*\* . The modeled values were 29 and 13.2 dB, resp.

ST variable diffraction efficiency phase mask silica; apodized Bragg \*\*\*grating\*\*\* optical fiber photomask

IT Diffraction \*\*\*gratings\*\*\*  
(apodized Bragg \*\*\*gratings\*\*\* photoimprinted into optical fibers using variable diffraction efficiency phase mask)

IT Photomasks  
(fabrication of variable diffraction efficiency phase mask by multiple dose \*\*\*ion\*\*\* \*\*\*implantation\*\*\* )

IT Optical diffraction  
(Bragg, apodized Bragg \*\*\*gratings\*\*\* photoimprinted into optical fibers using variable diffraction efficiency phase mask)

IT 7631-86-9, Silica, processes  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(fabrication of variable diffraction efficiency phase mask by implanting \*\*\*grating\*\*\* pattern in silica substrate with \*\*\*silicon\*\*\* ion)

IT 14175-55-4, \*\*\*Silicon\*\*\* (2+), uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(fabrication of variable diffraction efficiency phase mask by implanting \*\*\*grating\*\*\* pattern in silica substrate with \*\*\*silicon\*\*\* ion)

L7 ANSWER 54 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1995:1004256 CAPLUS

DN 124:101704

ED Entered STN: 26 Dec 1995

TI Atomic-force microscopy of submicron structures formed by ion and laser beams

AU Bukharev, A. A.; Lobkov, V. S.; Yanduganov, V. M.; Samarskii, E. A.; Berdunov, N> V.

CS Kazan. Fiz.-Tekh. Inst., Russia

SO Pis'ma v Zhurnal Tekhnicheskoi Fiziki (1995), 21(15), 72-7  
CODEN: PZTFDD; ISSN: 0320-0116

PB Nauka

DT Journal

LA Russian

CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB At.-force microscopy was used to \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* glass on the surface of which a micro-relief was formed with pulse laser radiation. Diffraction \*\*\*gratings\*\*\* were formed on Fe+-implanted quartz glass and (for comparison) on Sb+-implanted \*\*\*Si\*\*\* . Also at.-force microscope was used to analyze the glass surface before and after Fe+ implantation.

ST quartz iron implantation atomic force microscope; laser recording microstructure \*\*\*ion\*\*\* \*\*\*implanted\*\*\* glass

IT Surface structure  
(at.-force microscopy of submicron structures formed by ion and laser beams)

IT Glass, oxide  
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(at.-force microscopy of submicron structures formed by ion and laser beams)

IT Microscopes  
(at.-force, submicron structures formed by ion and laser beams)

IT Recording materials  
(optical, at.-force microscopy of submicron structures formed by ion and laser beams)

IT 7439-89-6, Iron, uses 7440-36-0, Antimony, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(at.-force microscopy of submicron structures formed by ion and laser

beams)

L7 ANSWER 55 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1995:889405 CAPLUS  
DN 123:355688  
ED Entered STN: 01 Nov 1995  
TI Investigation of recombination parameters in \*\*\*ion\*\*\*  
\*\*\*implanted\*\*\* layer-substrate \*\*\*Si\*\*\* structures  
AU Gaubas, E.; Jarasiunas, K.; Kaniava, A.; Vaitkus, J.  
CS Institute Material Science and Applied Research, Vilnius University,  
Vilnius, 2054, Lithuania  
SO Materials Research Society Symposium Proceedings (1995), 378 (Defect and  
Impurity Engineered Semiconductors and Devices), 603-8  
CODEN: MRSPDH; ISSN: 0272-9172  
PB Materials Research Society  
DT Journal  
LA English  
CC 76-2 (Electric Phenomena)  
Section cross-reference(s): 75  
AB The theor. and exptl. studies of recombination processes in implanted  
\*\*\*Si\*\*\* structures show that a modified technique of light induced  
absorption of IR and microwave radiation as well as transient  
\*\*\*grating\*\*\* technique allows one to det. parameters of implanted  
layers in non-destructive way. The change of excitation depth by varying  
the wavelength of light sources permits to measure recombination  
parameters. The variation of asymptotic lifetime of excess carriers in  
\*\*\*ion\*\*\* \*\*\*implanted\*\*\* structure is due to simultaneous changes  
of bulk and surface recombination parameters, while a non-monotonic  
dependence of  $\tau_{eff}$  vs.  $\phi$  is detd. by competition and redistribution  
of recombination flows to non-homogeneous excitation. Power-law dependence  
of diffraction efficiency on implantation dose in \*\*\*Si\*\*\* :P+ and  
\*\*\*Si\*\*\* :B+ enables to det. low implantation doses by contactless  
transient grating technique and to study process of thermal annealing.  
ST argon \*\*\*ion\*\*\* \*\*\*implantation\*\*\* \*\*\*silicon\*\*\* substrate;  
surface recombination \*\*\*ion\*\*\* \*\*\*implantation\*\*\* model  
IT Annealing  
(recombination parameters in \*\*\*ion\*\*\* \*\*\*implanted\*\*\*  
layer-substrate \*\*\*Si\*\*\* structures)  
IT Recombination of electron with hole  
(surface, recombination parameters in \*\*\*ion\*\*\* \*\*\*implanted\*\*\*  
layer-substrate \*\*\*Si\*\*\* structures)  
IT 7440-37-1, Argon, processes  
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical  
process); PROC (Process); USES (Uses)  
(recombination parameters in \*\*\*ion\*\*\* \*\*\*implanted\*\*\*  
layer-substrate \*\*\*Si\*\*\* structures)  
IT 7440-21-3, \*\*\*Silicon\*\*\*, properties  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(recombination parameters in \*\*\*ion\*\*\* \*\*\*implanted\*\*\*  
layer-substrate \*\*\*Si\*\*\* structures)

L7 ANSWER 56 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1995:805249 CAPLUS  
DN 123:322853  
ED Entered STN: 21 Sep 1995  
TI Transient reflecting \*\*\*grating\*\*\* for sub-surface analysis: GHz  
ultrasonic and thermal spectroscopies and imaging  
AU Sawada, T.; Harata, A.  
CS Dep. Applied Chem., Univ. Tokyo, Tokyo, 113, Japan  
SO Applied Physics A: Materials Science & Processing (1995), 61(3), 263-8  
CODEN: APAMFC  
PB Springer  
DT Journal  
LA English  
CC 66-3 (Surface Chemistry and Colloids)  
Section cross-reference(s): 72, 74, 76  
AB Ps time-resolved transient reflecting \*\*\*grating\*\*\* (TRG) measurements  
are demonstrated for GHz ultrasonic and thermal spectroscopies of thin  
films and sub-surface regions of sub- $\mu$ m scale. The measurements should  
be tools for electrochem. interface monitoring and time-resolved imaging.  
Results are presented to show \*\*\*ion\*\*\* - \*\*\*implantation\*\*\* -induced



surface hardening and unusual thermal-diffusion behavior near a  
 \*\*\*silicon\*\*\* surface. A model describing potential dependence of TRG  
 responses at an electrochem. interface is proposed. An image of  
 photocarrier d. is compared with a thermal image for a He- \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* wafer to demonstrate the time-resolved  
 imaging.

ST laser transient reflecting \*\*\*grating\*\*\* subsurface analysis; film  
 laser transient reflecting \*\*\*grating\*\*\* ; thermal ultrasonic  
 spectroscopy TRG subsurface film; \*\*\*silicon\*\*\* transient reflecting  
 \*\*\*grating\*\*\* subsurface analysis; electrochem interface transient  
 reflecting \*\*\*grating\*\*\*

IT Films  
 Heat transfer  
 Imaging  
 Laser radiation  
 Sound and Ultrasound  
 Thermal conductivity and conduction  
 (ultrasonic and thermal spectroscopies and imaging in laser  
 transient-reflecting- \*\*\*grating\*\*\* sub-surface anal.)

IT Interface  
 (electrode-electrolyte, ultrasonic and thermal spectroscopies and  
 imaging in laser transient-reflecting- \*\*\*grating\*\*\* sub-surface  
 anal.)

IT Surface  
 (sub-, ultrasonic and thermal spectroscopies and imaging in laser  
 transient-reflecting- \*\*\*grating\*\*\* sub-surface anal.)

IT 7440-21-3, \*\*\*Silicon\*\*\* , properties  
 RL: PRP (Properties)  
 (ultrasonic and thermal spectroscopies and imaging in laser  
 transient-reflecting- \*\*\*grating\*\*\* sub-surface anal.)

L7 ANSWER 57 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1995:753710 CAPLUS  
 DN 123:156103  
 ED Entered STN: 24 Aug 1995  
 TI Semiconductor laser and its manufacture  
 IN Mukohara, Kazumasa  
 PA Nippon Electric Co, Japan  
 SO Jpn. Kokai Tokkyo Koho, 5 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM H01S003-18  
 CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07122814	A2	19950512	JP 1993-287721	19931022
	JP 2561004	B2	19961204		
PRAI	JP 1993-287721		19931022		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	JP 07122814	ICM	H01S003-18
		IPCI	H01S0003-18 [ICM,6]
AB	The laser with a diffraction ***grating*** having dopants-contg. parts whose dopants are different from dopants detg. cond. type of a semiconductor crystal. In the manuf., the phase of the ***grating*** at a light-emitting face is controlled by etching the face with ***ion*** irradiation and measuring the ***dopant*** concn. with SIMS.		
ST	semiconductor laser dopant measurement, SIMS; mass spectrometry dopant detn laser		
IT	Lasers		
	(manuf. of semiconductor laser with controlling dopant concn. by SIMS)		
IT	Mass spectrometry		
	(secondary-ion, manuf. of semiconductor laser with controlling dopant concn. by SIMS)		
IT	7440-21-3, ***Silicon*** , uses 13494-80-9, Tellurium, uses RL: ANT (Analyte); DEV (Device component use); MOA (Modifier or additive use); ANST (Analytical study); USES (Uses) (dopant; manuf. of semiconductor laser with controlling dopant concn.		

by SIMS)  
IT 7440-31-5, Tin, uses  
RL: DEV (Device component use); MOA (Modifier or additive use); USES  
(Uses)  
(dopant; manuf. of semiconductor laser with controlling dopant concn.  
by SIMS)

IT 22398-80-7, Indium phosphide (InP), uses  
RL: DEV (Device component use); PEP (Physical, engineering or chemical  
process); PROC (Process); USES (Uses)  
(manuf. of semiconductor laser with controlling dopant concn. by SIMS)

L7 ANSWER 58 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1995:700389 CAPLUS  
DN 123:297501  
ED Entered STN: 26 Jul 1995  
TI The nonlinear multimode theory of defect deformational ordered surface  
structure generation by strong laser beams  
AU Emel'yanov, V. I.; Shlykov, Yu. G.  
CS Physics Faculty, Moscow State University, Moscow, 119989, Russia  
SO Laser Physics (1994), 4(1), 153-67  
CODEN: LAPHEJ; ISSN: 1054-660X  
PB MAIK Nauka/Interperiodica  
DT Journal  
LA English  
CC 66-3 (Surface Chemistry and Colloids)  
AB A multimode nonlinear theory of formation of surface periodic point defect  
deformational (DD) structures is developed. A general set of coupled  
nonlinear kinetic equations for DD \*\*\*gratings\*\*\* of the Fourier  
amplitudes is derived and reduced to a rate equation with allowance for  
diffusion and drift in q-space. The conditions for generation of  
multimode or single-mode DD structures are investigated, and periods,  
times of formation, and stationary amplitudes of DD \*\*\*gratings\*\*\* are  
detd. The theor. results are used for interpretation of previously  
obtained exptl. results on the generation of DD \*\*\*gratings\*\*\* in  
\*\*\*Si\*\*\* under ms laser irradiation and \*\*\*ion\*\*\* \*\*\*implantation\*\*\*

ST surface defect structure laser irradiation; \*\*\*silicon\*\*\* defect  
deformational structure irradiation; \*\*\*ion\*\*\* \*\*\*implantation\*\*\*  
\*\*\*silicon\*\*\* defect deformational structure

IT Ion beams  
(generation of defect deformational ordered surface structure by  
\*\*\*ion\*\*\* \*\*\*implantation\*\*\* )

IT Laser radiation  
Surface structure  
(nonlinear multimode theory of generation of defect deformational  
ordered surface structure by strong laser beams)

IT 7440-21-3, \*\*\*Silicon\*\*\*, processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(generation of defect deformational ordered surface structure by  
\*\*\*ion\*\*\* \*\*\*implantation\*\*\* and laser irradiation)

L7 ANSWER 59 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1995:461706 CAPLUS  
DN 123:98973  
ED Entered STN: 01 Apr 1995  
TI Transient reflecting \*\*\*grating\*\*\* study of \*\*\*ion\*\*\* -  
\*\*\*implanted\*\*\* semiconductors

AU Harata, A.; Nishimura, H.; Shen, Q.; Tanaka, T.; Sawada, T.  
CS Faculty Engineering, University Tokyo, Hongo, 7-3-1, Japan  
SO Journal de Physique IV: Proceedings (1994), 4(C7 8th International  
Topical Meeting on Photoacoustic and Photothermal Phenomena, 1994), 159-62  
CODEN: JPICEI; ISSN: 1155-4339  
DT Journal  
LA English  
CC 76-2 (Electric Phenomena)  
Section cross-reference(s): 66

AB Surface modification of \*\*\*Si\*\*\* (100) wafers induced by Ar- \*\*\*ion\*\*\*  
\*\*\*implantation\*\*\* ( \*\*\*ion\*\*\* energy, 300keV; dose, 10<sup>11</sup> - 10<sup>17</sup>  
atoms/cm<sup>2</sup>) was studied using a transient reflecting \*\*\*grating\*\*\*  
technique. Effects of the implantation on velocity, intensity and onset  
time of surface acoustic waves (SAW) are discussed accompanying the  
acoustic anisotropy. SAW velocity dispersion was also examined for one of

the lightly \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* sample (dose, 1011 atoms/cm2).

ST argon \*\*\*ion\*\*\* \*\*\*implantation\*\*\* \*\*\*silicon\*\*\* surface SAW  
IT Sound and Ultrasound  
(SAW velocity; surface modification of \*\*\*silicon\*\*\* (100) wafers induced by argon- \*\*\*ion\*\*\* \*\*\*implantation\*\*\* )

IT Surface structure  
(surface modification of \*\*\*silicon\*\*\* (100) wafers induced by argon- \*\*\*ion\*\*\* \*\*\*implantation\*\*\* )

IT 7440-37-1D, Argon, ions, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(surface modification of \*\*\*silicon\*\*\* (100) wafers induced by argon- \*\*\*ion\*\*\* \*\*\*implantation\*\*\* )

IT 7440-21-3, \*\*\*Silicon\*\*\* , properties  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
(surface modification of \*\*\*silicon\*\*\* (100) wafers induced by argon- \*\*\*ion\*\*\* \*\*\*implantation\*\*\* )

L7 ANSWER 60 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1995:208364 CAPLUS  
DN 122:43764  
ED Entered STN: 23 Nov 1994  
TI Local gallium \*\*\*implantation\*\*\* with focused \*\*\*ion\*\*\* beam and ambipolar lateral carrier transport in strained \*\*\*silicon\*\*\* -germanium/ \*\*\*silicon\*\*\* quantum wells

AU Okubo, A.; Fukatsu, S.; Shiraki, Y.  
CS Res. Cent. Advanced Sci. Technol. (RCAST), Univ. Tokyo, Tokyo, 153, Japan  
SO Applied Physics Letters (1994), 65(20), 2582-4  
CODEN: APPLAB; ISSN: 0003-6951  
PB American Institute of Physics  
DT Journal  
LA English  
CC 76-3 (Electric Phenomena)  
AB Lateral carrier diffusion in a strained Si1-xGex/ \*\*\*Si\*\*\* quantum well (QW) is reported using a periodic two-dimensional \*\*\*grating\*\*\* geometry defined by focused \*\*\*ion\*\*\* beam local-Ga- \*\*\*implantation\*\*\* . With systematically changing the \*\*\*grating\*\*\* period, the authors obsd. a clear dominance switch of steady-state photoluminescence (PL) intensity between defect-related luminescence from Ga-implanted \*\*\*grating\*\*\* stripes and PL emanating from the centered QW region. By fitting to a simple diffusion model, the lateral diffusion length was found to extend to several microns at low temps., whereas it increases with temp. up to 58 K.

ST gallium implantation \*\*\*silicon\*\*\* germanium quantum well;  
luminescence \*\*\*silicon\*\*\* germanium quantum well  
IT Luminescence  
(of gallium- \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*Si\*\*\* -Ge/ \*\*\*Si\*\*\* quantum wells)

IT Electric current carriers  
(transport of lateral carriers in Si1-xGex/ \*\*\*Si\*\*\* quantum well)

IT Semiconductor devices  
(quantum-well, local Ga \*\*\*implantation\*\*\* with focused \*\*\*ion\*\*\* beam and ambipolar lateral carrier transport in strained \*\*\*Si\*\*\* -Ge/ \*\*\*Si\*\*\* quantum wells)

IT 7440-55-3D, Gallium, \*\*\*ions\*\*\* , uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(local Ga \*\*\*implantation\*\*\* with focused \*\*\*ion\*\*\* beam and ambipolar lateral carrier transport in strained \*\*\*Si\*\*\* -Ge/ \*\*\*Si\*\*\* quantum wells)

IT 7440-21-3, \*\*\*Silicon\*\*\* , processes 52975-45-8, Germanium 37, \*\*\*silicon\*\*\* 63 (atomic)  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(local Ga \*\*\*implantation\*\*\* with focused \*\*\*ion\*\*\* beam and ambipolar lateral carrier transport in strained \*\*\*Si\*\*\* -Ge/ \*\*\*Si\*\*\* quantum wells)

L7 ANSWER 61 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1995:136623 CAPLUS  
DN 122:42186  
ED Entered STN: 08 Nov 1994

TI Fabrication and characterization of submicron \*\*\*gratings\*\*\* written  
 in planar silica glass with a focused ion beam.  
 AU Albert, Jacques; Malo, B.; Bilodeau, F.; Johnson, D. C.; Hill, K. O.;  
 Templeton, I. M.; Brebner, J. L.  
 CS Communications Research Centre, Ottawa, ON, K2H 8S2, Can.  
 SO Proceedings of SPIE-The International Society for Optical Engineering  
 (1994), 2213 (NANOFABRICATION TECHNOLOGIES AND DEVICE INTEGRATION), 78-88  
 CODEN: PSISDG; ISSN: 0277-786X  
 DT Journal  
 LA English  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)  
 AB Groove patterns with submicron lateral sizes and depths of several  
 hundreds of nanometres were defined in SiO2 glass surfaces by focused  
 \*\*\*ion\*\*\* beam \*\*\*implantation\*\*\* and differential wet etching in HF  
 solns. Nonperiodic arbitrary patterns can be defined and variable depth  
 achieved through local ion dose control. The fabrication of diffractive  
 optical elements for excimer lasers in the UV is described.  
 ST diffraction \*\*\*grating\*\*\* submicron silica ion beam  
 IT Etching  
 (fabrication and characterization of submicron \*\*\*gratings\*\*\*  
 written in planar silica glass with focused ion beam.)  
 IT \*\*\*Ion\*\*\* beams  
 ( \*\*\*implantation\*\*\* ; fabrication and characterization of submicron  
 \*\*\*gratings\*\*\* written in planar silica glass with focused ion beam.)  
 IT Diffraction \*\*\*gratings\*\*\*  
 (submicron; fabrication and characterization of submicron  
 \*\*\*gratings\*\*\* written in planar silica glass with focused ion beam.)  
 IT 60676-86-0, Vitreous silica  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical  
 process); PROC (Process); USES (Uses)  
 (fabrication and characterization of submicron \*\*\*gratings\*\*\*  
 written in planar silica glass with focused ion beam.)  
 IT 14175-55-4, \*\*\*Silicon\*\*\* 2+, processes 15456-07-2, Gold 2+,  
 processes 22537-20-8, Beryllium 2+, processes  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (fabrication and characterization of submicron \*\*\*gratings\*\*\*  
 written in planar silica glass with focused ion beam.)  
 L7 ANSWER 62 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1994:119581 CAPLUS  
 DN 120:119581  
 ED Entered STN: 05 Mar 1994  
 TI Fast photothermal relaxation processes in metals and semiconductors  
 studied using transient reflecting \*\*\*gratings\*\*\*  
 AU Nishimura, Hiroyuki; Harata, Akira; Sawada, Tsuguo  
 CS Fac. Eng., Univ. Tokyo, Tokyo, 113, Japan  
 SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes  
 & Review Papers (1993), 32(11A), 5149-54  
 CODEN: JAPNDE; ISSN: 0021-4922  
 DT Journal  
 LA English  
 CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)  
 AB Dynamic processes forming the transient reflecting \*\*\*gratings\*\*\* are  
 exptl. studied in the picosecond time regime for both metals and  
 semiconductors. The shapes of the initial parts of the \*\*\*grating\*\*\*  
 signals were examd. with respect to the pump and probe intensities,  
 optical configurations of polarization directions and \*\*\*ion\*\*\*  
 \*\*\*implantation\*\*\* doses. For metals, the rising part is influenced by  
 the temp. \*\*\*grating\*\*\* independently of the corrugation  
 \*\*\*grating\*\*\* due to surface acoustic waves. For \*\*\*Si\*\*\*, the peak  
 or shoulder at the initial part is attributed to the concn.  
 \*\*\*grating\*\*\* of the photoexcited carriers, and it directly reflects the  
 photothermal relaxation rate.  
 ST photothermal relaxation metal semiconductor transient \*\*\*grating\*\*\*  
 IT Diffraction \*\*\*gratings\*\*\*  
 (metals and semiconductors photothermal relaxation studied using  
 transient reflecting photoexcited)  
 IT Thermooptical effect  
 (relaxation, in metals and semiconductors, from transient reflecting  
 \*\*\*grating\*\*\* )

IT 7440-37-1D, Argon, ion, properties  
 RL: PRP (Properties)  
 (photothermal relaxation processes in \*\*\*silicon\*\*\* contg., from  
 transient reflecting \*\*\*grating\*\*\* )

IT 11126-22-0, \*\*\*Silicon\*\*\* oxide  
 RL: PRP (Properties)  
 (photothermal relaxation processes in \*\*\*silicon\*\*\* with surface  
 layers of, from transient reflecting \*\*\*grating\*\*\* )

IT 7440-21-3, \*\*\*Silicon\*\*\* , properties  
 RL: PRP (Properties)  
 (photothermal relaxation processes in undoped and argon \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* , from transient reflecting \*\*\*grating\*\*\* )

IT 7429-90-5, Aluminum, properties 7440-57-5, Gold, properties  
 RL: PRP (Properties)  
 (photothermal relaxation processes in, from transient reflecting  
 \*\*\*grating\*\*\* )

L7 ANSWER 63 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1993:679554 CAPLUS  
 DN 119:279554  
 ED Entered STN: 25 Dec 1993  
 TI Laser-stimulated scattering microscope study of an \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* surface

AU Harata, Akira; Shen, Qing; Tanaka, Takayuki; Sawada, Tsuguo  
 CS Fac. Eng., Univ. Tokyo, Tokyo, 113, Japan  
 SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes  
 & Review Papers (1993), 32(8), 3633-8  
 CODEN: JAPNDE; ISSN: 0021-4922

DT Journal  
 LA English  
 CC 66-3 (Surface Chemistry and Colloids)  
 Section cross-reference(s): 65, 73, 76

AB Surface modification of a \*\*\*Si\*\*\* single crystal induced by Ar  
 \*\*\*ion\*\*\* \*\*\*implantation\*\*\* of a light dose condition (300 keV,  
 1011 atoms/cm<sup>2</sup>) was studied by using a laser-stimulated scattering  
 microscope, whose operational principle is based on microscopic  
 measurements of transient reflecting \*\*\*gratings\*\*\* (TRGs).  
 One-dimensional distributions of various material parameters, velocity,  
 onset time and attenuation coeff. of surface acoustic waves and parameters  
 relating to thermal diffusion, thermal expansion and optical absorption,  
 are detd. by analyzing the TRG responses measured sequentially along a  
 line across the implanted and unimplanted regions. Some theor. aspects  
 are presented for the empirical equation used in deducing these parameters  
 from the TRG responses. The change in the anisotropic property of the  
 acoustic velocity is also discussed.

ST transient reflecting \*\*\*grating\*\*\* laser scattering microscope;  
 \*\*\*ion\*\*\* \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* surface laser  
 microscopy; acoustic wave surface \*\*\*ion\*\*\* \*\*\*implanted\*\*\*  
 \*\*\*silicon\*\*\*

IT \*\*\*Ion\*\*\* beams  
 ( \*\*\*implantation\*\*\* of, in semiconductor surface modification)

IT Microscopes  
 (laser-stimulated scattering, for surface studies of \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* semiconductors)

IT Semiconductor materials  
 (surface characterization of, by laser-stimulated scattering microscope  
 following \*\*\*ion\*\*\* \*\*\*implantation\*\*\* )

IT Diffraction \*\*\*gratings\*\*\*  
 (transient reflecting, in surface studies of \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* semiconductors)

IT Sound and Ultrasound  
 (surface, attenuation of, on \*\*\*ion\*\*\* - \*\*\*implanted\*\*\*  
 semiconductors)

IT Diffusion  
 (surface, on semiconductors following \*\*\*ion\*\*\*  
 \*\*\*implantation\*\*\* , laser-stimulated scattering microscope for study  
 of)

IT 7440-21-3, \*\*\*Silicon\*\*\* , properties  
 RL: PRP (Properties)  
 (surface characterization of, by laser-stimulated scattering microscope  
 following \*\*\*ion\*\*\* \*\*\*implantation\*\*\* )

IT 14791-69-6, Argon ion (Ar<sup>1+</sup>), properties

RL: PRP (Properties)  
(surface modification by, of \*\*\*silicon\*\*\* , laser-stimulated  
scattering microscope study of)

L7 ANSWER 64 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1993:529140 CAPLUS  
DN 119:129140  
ED Entered STN: 18 Sep 1993  
TI Lateral straggle of \*\*\*silicon\*\*\* and beryllium focused- \*\*\*ion\*\*\*  
beam \*\*\*implanted\*\*\* in gallium arsenide  
AU Vignaud, D.; Musil, C. R.; Etchin, S.; Antoniadis, D. A.; Melngailis, J.  
CS Dep. Electr. Eng. Comput. Sci., Massachusetts Inst. Technol., Cambridge,  
MA, 02139, USA  
SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer  
Structures (1993), 11(3), 581-6  
CODEN: JVTBD9; ISSN: 0734-211X  
DT Journal  
LA English  
CC 76-1 (Electric Phenomena)  
AB The lateral distribution of focused- \*\*\*ion\*\*\* -beam \*\*\*implanted\*\*\*  
\*\*\*Si\*\*\* and Be atoms was studied by measuring the elec. resistivity in  
\*\*\*grating\*\*\* structures. The \*\*\*gratings\*\*\* which were oriented  
perpendicular to the direction of the current flow were implanted with  
\*\*\*silicon\*\*\* and beryllium at 280 and 260 keV, resp. They were  
implanted into semi-insulating materials cut on and off axis, and then  
rapid thermal annealed. The lateral straggle was less than 100 nm for  
\*\*\*Si\*\*\* and equal to 190 nm for the Be implants. The std. deviation of  
the lateral distribution increased with the dose. This is attributed to a  
concn.-dependent diffusion which results in an anomalously high diffusion  
coeff. Comparison of the exptl. parameters of the implanted distribution  
with values found in std. tables or calcd. by a Monte Carlo TRIM code  
seems to indicate that all simulations overestimate the lateral straggle  
at the expense of the penetration depth.  
ST implant straggle FIB implantation gallium arsenide; \*\*\*silicon\*\*\*  
implant straggle gallium arsenide; beryllium implant straggle gallium  
arsenide  
IT Diffusion  
(of beryllium or \*\*\*silicon\*\*\* implant in gallium arsenide, lateral  
straggle effect in)  
IT Electric resistance  
(of grated gallium arsenide, straggle of beryllium or \*\*\*silicon\*\*\*  
implant in relation to)  
IT 1303-00-0, Gallium arsenide, uses  
RL: USES (Uses)  
(elec. resistivity in implant beryllium or \*\*\*silicon\*\*\*  
distribution study in)  
IT 14175-55-4, \*\*\*Silicon\*\*\* (2+), uses 22537-20-8, Beryllium(2+), uses  
RL: USES (Uses)  
(lateral straggle of implant of, in semi-insulating gallium arsenide)

L7 ANSWER 65 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1993:223782 CAPLUS  
DN 118:223782  
ED Entered STN: 29 May 1993  
TI Electron cyclotron resonance microwave discharge for oxide deposition  
using tetramethylcyclotetrasiloxane  
AU Pai, C. S.; Miner, J. F.; Foo, P. D.  
CS AT and T Bell Lab., Murray Hill, NJ, 07974, USA  
SO Journal of Applied Physics (1993), 73(7), 3531-8  
CODEN: JAPIAU; ISSN: 0021-8979  
DT Journal  
LA English  
CC 76-14 (Electric Phenomena)  
Section cross-reference(s): 67  
AB Results of the dielec. oxide films deposited at 300.degree. by using  
tetramethylcyclotetrasiloxane/oxygen chem. in a reactor with electron  
cyclotron resonance microwave discharge are presented. Quality oxide is  
deposited with an O2/tetramethylcyclotetrasiloxane flow-rate ratio > 3.  
The properties of the deposited films are characterized by prism  
\*\*\*coupler\*\*\* , IR spectroscopy, AES, RBS, and triangular voltage sweep  
measurements. The deposition rate using tetramethylcyclotetrasiloxane is  
about 4 X higher than tetraethylorthosilicate under similar processing

conditions. The authors obtained oxide films with superior quality (both material and elec. properties) at a deposition rate of 5000 .ANG./min. The step coverage of oxide is excellent when rf bias is applied on the substrate during the deposition. Trenches with aspect ratios >1.50 can be filled without voids. Details of reaction chemistries for oxide deposition in the electron cyclotron resonance reactor and the effect of \*\*\*ion\*\*\* bombardment\*\*\* on the oxide profile are discussed.

ST silica deposition ECR discharge tetramethylcyclotetrasiloxane oxygen  
IT Vapor deposition processes  
(microwave-discharge-enhanced, in dielec. oxide deposition, from tetramethylcyclotetrasiloxane-oxygen mixt.)

IT 2370-88-9, Tetramethylcyclotetrasiloxane  
RL: USES (Uses)  
(microwave discharge in mixt. of oxygen with, in dielec. oxide film deposition)

IT 7782-44-7, Oxygen, uses  
RL: USES (Uses)  
(microwave discharge in mixt. of tetramethylcyclotetrasiloxane and, in dielec. oxide deposition)

IT 11126-22-0, \*\*\*Silicon\*\*\* oxide  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(microwave discharge in tetramethylcyclotetrasiloxane-oxygen mixt. in deposition of)

L7 ANSWER 66 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1993:199003 CAPLUS  
DN 118:199003  
ED Entered STN: 14 May 1993  
TI Laser stimulated scattering microscope: a tool for investigating modified metallic surfaces  
AU Harata, Akira; Nishimura, Hiroyuki; Tanaka, Takayuki; Sawada, Tsuguo  
CS Fac. Eng., Univ. Tokyo, Tokyo, 113, Japan  
SO Review of Scientific Instruments (1993), 64(3), 618-22  
CODEN: RSINAK; ISSN: 0034-6748  
DT Journal  
LA English  
CC 66-3 (Surface Chemistry and Colloids)  
Section cross-reference(s): 56, 73, 76

AB An instrument, based on the principle of microscopic measurements by using transient reflecting \*\*\*gratings\*\*\*, was built for study of modified metallic surfaces. After holog. illumination of focused light pulses of short duration, dynamic processes were obsd. by detecting the reflecting diffraction of the synchronously delayed probe pulse, while the sample was scanned 2-dimensionally. Distribution imaging and relaxation time (or diffusivity) imaging were demonstrated for some \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*Si\*\*\* wafers.

ST laser scattering microscope modified metal surface; \*\*\*silicon\*\*\*  
\*\*\*ion\*\*\* \*\*\*implanted\*\*\* surface imaging microscopy  
IT Surface  
(imaging of, laser scattering microscope for)  
IT Microscopes  
(laser scattering, for metal or semiconductor modified surface studies)  
IT Metals, properties  
RL: PRP (Properties)  
(surface imaging of modified, laser scattering microscope for)

IT 7440-21-3, \*\*\*Silicon\*\*\*, properties  
RL: PRP (Properties)  
(surface imaging of \*\*\*ion\*\*\* - \*\*\*implanted\*\*\*, laser scattering microscope for)

L7 ANSWER 67 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1993:31348 CAPLUS  
DN 118:31348  
ED Entered STN: 24 Jan 1993  
TI Manufacture of light-receiving device  
IN Wada, Yoshiyuki  
PA NEC Corp., Japan  
SO Jpn. Kokai Tokkyo Koho, 4 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
IC ICM H01L027-14

ICS H01L021-76; H01L031-12  
CC 76-3 (Electric Phenomena)  
Section cross-reference(s): 73

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04152670	A2	19920526	JP 1990-278263	19901017
PRAI	JP 1990-278263		19901017		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 04152670	ICM	H01L027-14
	ICS	H01L021-76; H01L031-12
	IPCI	H01L0027-14 [ICM,5]; H01L0021-76 [ICS,5]; H01L0031-12 [ICS,5]

AB A method for manufg. a light-receiving device useful as a photocoupler involves (1) forming insulator element-isolation regions on a semiconductor layer; (2) forming p-n junctions on the regions surrounded with the isolation regions; (3) forming an \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* polycryst. \*\*\*Si\*\*\* layer on the overall surfaces; (4) patterning the \*\*\*Si\*\*\* layer to leave the layer only on the semiconductor layer having 1 p-n junction; (5) forming an \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* polycryst. \*\*\*Si\*\*\* layer for a 2nd time to form an emitter layer after heat treating; (6) etching the \*\*\*Si\*\*\* layer to leave only the portion contacting the n+ or p+ region; and (7) forming a metal interconnection. A low-resistance \*\*\*Si\*\*\* film is obtained.

ST \*\*\*silicon\*\*\* film light receiving device; photocoupler  
\*\*\*silicon\*\*\* film

IT Photoelectric devices

( \*\*\*silicon\*\*\* films for, formation of low-resistance)

IT Optical instruments

(electro-, \*\*\*couplers\*\*\*, formation of low-resistance  
\*\*\*silicon\*\*\* films for)

IT 7440-21-3, \*\*\*Silicon\*\*\*, uses

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(polycryst. films, formation of low-resistance, in manuf. of light-receiving devices)

L7 ANSWER 68 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1993:29214 CAPLUS

DN 118:29214

ED Entered STN: 24 Jan 1993

TI Refractive-index changes in fused silica produced by heavy- \*\*\*ion\*\*\*  
\*\*\*implantation\*\*\* followed by photobleaching

AU Albert, J.; Malo, B.; Hill, K. O.; Johnson, D. C.; Brebner, J. L.; Leonelli, R.

CS Commun. Res. Cent., Ottawa, ON, K2H 8S2, Can.

SO Optics Letters (1992), 17(23), 1652-4

CODEN: OPLEDP; ISSN: 0146-9592

DT Journal

LA English

CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB The changes in refractive index, optical absorption, and vol. of synthetic fused silica resulting from the \*\*\*implantation\*\*\* of germanium and \*\*\*silicon\*\*\* \*\*\*ions\*\*\* at energies of 3 and 5 MeV are reported. Implantation changes the d. and generates UV color centers in the silica, which increases the refractive index at visible wavelengths by .apprx.1%. Irradn. of the implanted samples with 249-nm light from a KrF excimer laser photobleaches the color centers and reduces the index by more than 0.1%. Photobleaching is used to write a 4.3-.mu.m pitch diffraction \*\*\*grating\*\*\* in the implanted silica.

ST refraction fused silica \*\*\*ion\*\*\* \*\*\*implantation\*\*\*  
photobleaching; \*\*\*silicon\*\*\* germanium fused silica

IT Color centers

(in fused silica following \*\*\*ion\*\*\* \*\*\*implantation\*\*\* )

IT Diffraction \*\*\*gratings\*\*\*

(in \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* fused silica)

IT Laser radiation

(in photobleaching of \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* fused silica)

IT Optical absorption



Refractive index and Optical refraction  
(of \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* fused silica)

IT Bleaching  
(photochem., of \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* fused \*\*\*silicon\*\*\* )

IT 7440-21-3D, \*\*\*Silicon\*\*\* , ions, properties 7440-56-4D, Germanium, ions, properties  
RL: PRP (Properties)  
(optical properties of fused silica implanted with)

L7 ANSWER 69 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1992:582622 CAPLUS  
DN 117:182622  
ED Entered STN: 01 Nov 1992  
TI Application of laser-induced GHz surface acoustic waves to evaluate \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* semiconductors  
AU Nishimura, Hiroyuki; Harata, Akira; Sawada, Tsuguo  
CS Fac. Eng., Univ. Tokyo, Tokyo, 113, Japan  
SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers (1992), 31(Suppl. 31-1), 91-3  
CODEN: JAPNDE; ISSN: 0021-4922  
DT Journal  
LA English  
CC 76-3 (Electric Phenomena)  
Section cross-reference(s): 65, 73  
AB The transient reflecting \*\*\*grating\*\*\* method has been used to characterize \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* layers and demonstrate its usefulness for nondestructive and remote evaluation of modified solid surfaces. The surface acoustic velocity, relaxation const. and signal intensity were measured as functions of ion dose. The results suggested that damage induced by implantation significantly affected the surface properties even under light dose conditions. The subnanosecond temporal resoln. of the present method provided successful characterization of the implanted layers.

ST \*\*\*ion\*\*\* \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* layer SAW study;  
acoustic wave \*\*\*ion\*\*\* \*\*\*implanted\*\*\* layer

IT Semiconductor materials  
( \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* layer investigation of, by laser-induced SAW)

IT Laser radiation  
(surface acoustic wave induced by, for \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* layer study)

IT Sound and Ultrasound  
(surface, laser-induced, in \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* layer investigation)

IT 7440-21-3, \*\*\*Silicon\*\*\* , miscellaneous  
RL: MSC (Miscellaneous)  
( \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* layer investigation of, by laser-induced SAW)

L7 ANSWER 70 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1992:264757 CAPLUS  
DN 116:264757  
ED Entered STN: 27 Jun 1992  
TI Radiative and nonradiative recombination processes in \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* semi-insulating gallium arsenide  
AU Jarasiunas, K.; Petrauskas, M.; Netiksis, V.; Vaitkus, J.; Noreika, D.; Rueckmann, I.  
CS Vilnius Univ., Vilnius, Lithuania  
SO Key Engineering Materials (1992), 65(Opt. Charact. Semicond.), 57-62  
CODEN: KEMAEY; ISSN: 1013-9826  
DT Journal  
LA English  
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
Section cross-reference(s): 76  
AB Optical properties of GaAs( \*\*\*Si\*\*\* +) were studied by transient \*\*\*grating\*\*\* and luminescence techniques to reveal carriers recombination dynamics and mechanisms in \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* matters.  
ST recombination process \*\*\*silicon\*\*\* implanted gallium arsenide; luminescence \*\*\*silicon\*\*\* implanted gallium arsenide

IT Recombination of electron with hole  
 (in \*\*\*silicon\*\*\* (1+)-doped gallium arsenide)  
 IT Luminescence  
 (of \*\*\*silicon\*\*\* (1+)-doped gallium arsenide)  
 IT Electric current carriers  
 (recombination dynamics and mechanisms in \*\*\*silicon\*\*\* (1+)-doped  
 gallium arsenide)  
 IT 14067-07-3, \*\*\*Silicon\*\*\* (1+), properties  
 RL: PRP (Properties)  
 (radiative and nonradiative recombination processes in gallium arsenide  
 doped with)  
 IT 1303-00-0, Gallium arsenide, properties  
 RL: PRP (Properties)  
 (radiative and nonradiative recombination processes in \*\*\*silicon\*\*\*  
 (1+)-doped)

L7 ANSWER 71 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1992:225125 CAPLUS  
 DN 116:225125  
 ED Entered STN: 31 May 1992  
 TI Study on damages in \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*silicon\*\*\*  
 using transient reflecting \*\*\*gratings\*\*\*  
 AU Nishimura, Hiroyuki; Harata, Akira; Sawada, Tsuguo  
 CS Fac. Eng., Univ. Tokyo, Tokyo, 113, Japan  
 SO Analytical Sciences (1991), 7(Suppl., Proc. Int. Congr. Anal. Sci., 1991,  
 Pt. 2), 1235-6  
 CODEN: ANSCEN; ISSN: 0910-6340  
 DT Journal  
 LA English  
 CC 75-3 (Crystallography and Liquid Crystals)  
 AB \*\*\*Ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*Si\*\*\* layers were characterized  
 by using transient reflecting \*\*\*grating\*\*\* method. The signal  
 intensity and relaxation const. were measured as functions of ion dose.  
 Damage induced by \*\*\*ion\*\*\* - \*\*\*implantation\*\*\* suppresses thermal  
 diffusion even under a light dose condition.  
 ST damage \*\*\*ion\*\*\* \*\*\*implantation\*\*\* \*\*\*silicon\*\*\*  
 IT 7440-21-3, \*\*\*Silicon\*\*\* , properties  
 RL: PRP (Properties)  
 (damage in \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* , transient reflecting  
 \*\*\*gratings\*\*\* in study of)

L7 ANSWER 72 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1992:164015 CAPLUS  
 DN 116:164015  
 ED Entered STN: 17 Apr 1992  
 TI Electron cyclotron resonance microwave discharge for oxide deposition  
 using tetraethoxysilane  
 AU Pai, C. S.; Miner, J. F.; Foo, P. D.  
 CS AT and T Bell Lab., Murray Hill, NJ, 07974, USA  
 SO Journal of the Electrochemical Society (1992), 139(3), 850-6  
 CODEN: JESOAN; ISSN: 0013-4651  
 DT Journal  
 LA English  
 CC 76-10 (Electric Phenomena)  
 AB Results of the dielec. oxide films deposited using tetraethoxysilane  
 (TEOS) + O2 chem. in a reactor with electron cyclotron resonance (ECR)  
 microwave discharge are presented. In the reactor, O2 gas is introduced  
 into the plasma chamber and TEOS is introduced into the deposition  
 chamber, which is downstream of the plasma. The properties of the  
 deposited films are characterized by prism \*\*\*coupler\*\*\* , IR, Auger  
 electron spectroscopy, Rutherford backscattering, and triangular voltage  
 sweep measurements. The quality of the deposited films is found to be  
 critically dependent on the ratio of O2 flow rate to the TEOS flow rate  
 during the deposition. The consumption rate of TEOS in the reaction is  
 high and the deposition rate is found to be proportional to the flow rate  
 of TEOS. By applying addnl. RF bias on the substrate during deposition,  
 the oxide profile can be modified and the reentrant angle which is  
 normally obsd. on the shoulder of the profile can be eliminated. Authors  
 also obsd. that \*\*\*ion\*\*\* \*\*\*bombardments\*\*\* during the deposition  
 play important roles in detg. the oxide quality. The quality of the oxide  
 deposited using a bias ECR reactor is good in terms of both material and  
 elec. properties. In addn., the step coverage is excellent for Al lines

with high aspect ratios. The reaction chemistries for oxide deposition in the ECR reactor and the effects from impacts of energized ions during oxide deposition to the film quality and the profile are also discussed.

ST electron cyclotron resonance microwave discharge deposition;  
 \*\*\*silicon\*\*\* dioxide deposition tetraethoxysilane oxygen

IT Infrared spectra  
 (of \*\*\*silicon\*\*\* dioxide deposited by electron cyclotron resonance microwave discharge)

IT Vapor deposition processes  
 (of \*\*\*silicon\*\*\* dioxide from tetraethoxysilane-oxygen mixt.)

IT 7429-90-5, Aluminum, miscellaneous  
 RL: MSC (Miscellaneous)  
 (deposition of silica for lines for, by electron cyclotron resonance microwave discharge)

IT 7631-86-9, \*\*\*Silicon\*\*\* dioxide, miscellaneous  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (deposition of, by electron cyclotron resonance microwave discharge, from tetraethoxysilane-oxygen mixt.)

IT 78-10-4, Tetraethoxysilane  
 RL: USES (Uses)  
 (electron cyclotron resonance microwave discharge in oxygen with, \*\*\*silicon\*\*\* dioxide deposition from)

IT 7782-44-7, Oxygen, uses  
 RL: USES (Uses)  
 (electron cyclotron resonance microwave discharge in tetraethoxysilane with, \*\*\*silicon\*\*\* dioxide deposition from)

L7 ANSWER 73 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1991:546031 CAPLUS  
 DN 115:146031  
 ED Entered STN: 05 Oct 1991  
 TI Fabrication and characteristics of gallium arsenide-aluminum gallium arsenide tunable laser diodes with DBR and phase-control sections integrated by compositional disordering of a quantum well  
 AU Hirata, Takaaki; Maeda, Minoru; Suehiro, Masayuki; Hosomatsu, Haruo  
 CS Cent. Res. Lab., Opt. Meas. Technol. Dev. Co. Ltd., Musashino, 180, Japan  
 SO IEEE Journal of Quantum Electronics (1991), 27(6), 1609-15  
 CODEN: IEJQA7; ISSN: 0018-9197  
 DT Journal  
 LA English  
 CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 AB GaAs-AlGaAs GRIN-SCH-SQW tunable DBR laser diodes are fabricated by EB lithog., \*\*\*ion\*\*\* \*\*\*implantation\*\*\*, and two-step MOVPE growth. Active and passive waveguides are monolithically integrated by the compositional disordering of quantum-well heterostructures using \*\*\*silicon\*\*\* \*\*\*ion\*\*\* \*\*\*implantation\*\*\*. First-order \*\*\*gratings\*\*\* and rib waveguides are adopted with EB lithog. to improve lasing characteristics, and they have wide application to photonic integrated circuits. Waveguide losses of partially disordered GRIN-SCH-SQW passive waveguides are as low as 4.4 cm<sup>-1</sup> at the lasing wavelength. A narrow linewidth as low as 560 kHz and a frequency tuning of more than 2.9 THz are obtained. The results show that this fabrication process is useful for photonic integrated circuits.

ST aluminum gallium arsenide laser device structure  
 IT Lasers  
 (aluminum gallium arsenide-gallium arsenide, tunable distributed Bragg-reflector)

IT 1303-00-0, Gallium arsenide, uses and miscellaneous  
 RL: USES (Uses)  
 (lasers from aluminum gallium arsenide and, tunable distributed Braggs reflector)

IT 7440-21-3, \*\*\*Silicon\*\*\*, uses and miscellaneous 7440-66-6, Zinc, uses and miscellaneous  
 RL: USES (Uses)  
 (lasers from aluminum gallium arsenide-gallium arsenide doped with, tunable distributed Bragg reflector)

IT 106070-09-1, Aluminum gallium arsenide (Al<sub>0.3</sub>Ga<sub>0.7</sub>As) 106804-30-2, Aluminum gallium arsenide (Al<sub>0.6</sub>Ga<sub>0.4</sub>As)  
 RL: DEV (Device component use); USES (Uses)  
 (lasers from gallium arsenide in, distributed Bragg reflector)

L7 ANSWER 74 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1991:438137 CAPLUS  
 DN 115:38137  
 ED Entered STN: 27 Jul 1991  
 TI Novel microscopy using stimulated light scattering by laser-induced  
 transient reflecting \*\*\*gratings\*\*\* on metallic surfaces  
 AU Harata, Akira; Sawada, Tsuguo  
 CS Fac. Eng., Univ. Tokyo, Tokyo, 113, Japan  
 SO Applied Physics Letters (1991), 58(17), 1839-41  
 CODEN: APPLAB; ISSN: 0003-6951  
 DT Journal  
 LA English  
 CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)  
 AB A novel microscopic method, based on the technique of laser-induced  
 transient reflecting \*\*\*gratings\*\*\*, is proposed to monitor  
 \*\*\*ion\*\*\* \*\*\*implantation\*\*\* in \*\*\*silicon\*\*\* by noncontact and  
 nondestructive ways. Some unique advantages of this technique, such as  
 highly sensitivity to ion dose and potential real time imaging capability,  
 are demonstrated.  
 ST microscopy light scattering laser induced \*\*\*grating\*\*\*;  
 \*\*\*silicon\*\*\* light scattering laser induced \*\*\*grating\*\*\*; metal  
 light scattering laser induced \*\*\*grating\*\*\*  
 IT Diffraction \*\*\*gratings\*\*\*  
 (light scattering by laser-induced transient reflecting, microscopy  
 using stimulated)  
 IT Light  
 (scattering of, by laser-induced transient reflecting \*\*\*gratings\*\*\*  
 on metallic surfaces, microscopy using)  
 IT Laser radiation, chemical and physical effects  
 (transient reflecting \*\*\*gratings\*\*\* on metallic surfaces induced  
 by, microscopy using stimulated light scattering by)  
 IT Microscopy  
 (using stimulated light scattering by laser-induced transient  
 reflecting \*\*\*gratings\*\*\* on metallic surfaces)  
 IT 7440-21-3, \*\*\*Silicon\*\*\*, properties  
 RL: PRP (Properties)  
 (light scattering by laser-induced transient reflecting  
 \*\*\*gratings\*\*\* on surface of, microscopy using)

L7 ANSWER 75 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1991:175632 CAPLUS  
 DN 114:175632  
 ED Entered STN: 03 May 1991  
 TI Investigation of the dynamics of pulsed laser annealing of \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* by the picosecond transient  
 \*\*\*grating\*\*\* technique  
 AU Baltramiejunas, R.; Gaska, R.; Kuokstis, E.; Netiksis, V.; Petrauskas, M.  
 CS Vilnius, USSR  
 SO Physical Research (1990), 13(EPM '89, Energy Pulse Part. Beam Modif.  
 Mater.), 220-2  
 CODEN: PHSREL; ISSN: 0863-4947  
 DT Journal  
 LA English  
 CC 76-1 (Electric Phenomena)  
 Section cross-reference(s): 75  
 AB The aim of the present paper is to investigate the influence of As  
 \*\*\*ion\*\*\* \*\*\*implantation\*\*\* and the following nanosecond laser  
 annealing (NLA) on the relaxation characteristics of nonequil. carriers  
 (NC) in \*\*\*Si\*\*\* crystals. The time probing technique of the decay of  
 dynamic diffraction \*\*\*gratings\*\*\* (DG) induced by the interference  
 field of laser radiation was used to investigate relaxation of NC.  
 ST implantation annealing \*\*\*silicon\*\*\* transient \*\*\*grating\*\*\*  
 method; annealing \*\*\*silicon\*\*\* picosecond transient \*\*\*grating\*\*\*  
 technique; carrier relaxation nonequil method  
 IT Electric current carriers  
 (nonequil., relaxation of, in \*\*\*silicon\*\*\*, picosecond transient  
 \*\*\*grating\*\*\* technique in study of)  
 IT 7440-38-2D, Arsenic, \*\*\*ions\*\*\*, uses and miscellaneous  
 RL: USES (Uses)  
 (\*\*\*implantation\*\*\* of, in \*\*\*silicon\*\*\*, picosecond transient  
 \*\*\*grating\*\*\* technique in study of)

IT 7440-21-3, \*\*\*Silicon\*\*\* , uses and miscellaneous  
 RL: USES (Uses)  
 ( \*\*\*ion\*\*\* \*\*\*implantation\*\*\* and laser annealing of,  
 picosecond transient \*\*\*grating\*\*\* technique in study of)

L7 ANSWER 76 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1990:602428 CAPLUS  
 DN 113:202428  
 ED Entered STN: 23 Nov 1990  
 TI Formation of surface inversion layer in fluorine(1+)-implanted n-type  
 \*\*\*silicon\*\*\*

AU Chu, C. H.; Chen, L. J.; Hwang, H. L.  
 CS Dep. Mater. Sci. Eng., Natl. Tsing Hua Univ., Hsinchu, Taiwan  
 SO Journal of Crystal Growth (1990), 103(1-4), 188-96  
 CODEN: JCRGAE; ISSN: 0022-0248

DT Journal  
 LA English  
 CC 76-3 (Electric Phenomena)  
 AB Influences of fluorine \*\*\*ion\*\*\* \*\*\*implantation\*\*\* on the elec.  
 properties of n-type \*\*\*silicon\*\*\* have been investigated by electron  
 beam induced current (EBIC), and Hall and MOS high-frequency  
 capacitance-voltage (HFCV) measurements. A \*\*\*grating\*\*\* mask was  
 used to delineate the implantation region so that the F+-implanted and  
 unirradiated areas were located in the same Al/n-type \*\*\*Si\*\*\*  
 Schottky diode region. EBIC images, obtained with different electron beam  
 energies, normal and parallel to the diode surface, and EBIC collection  
 efficiencies in the implanted and unirradiated areas were recorded. By  
 fitting data of energy-dependent EBIC collection efficiency into the  
 theor. EBIC model of Schottky diode, the thickness of the metal layer,  
 depletion layer width, minority carrier diffusion length in the substrate  
 and EBIC collection efficiency in the deletion region were detd. The  
 minority carrier recombination in the fluorine implanted area was found to  
 be higher than that of the blank \*\*\*Si\*\*\* area under Schottky contact.  
 Outside the Schottky contact, an inversion layer was obsd. to form at the  
 surface of the implanted area. The structural perfection of the F+  
 implanted area was investigated by cross-sectional TEM (XTEM). The p-type  
 characterization in the surface layer of the F+ implanted area was also  
 confirmed by the Hall and HFCV measurements.

ST surface inversion layer fluorine implanted \*\*\*silicon\*\*\*  
 IT 7440-21-3, \*\*\*Silicon\*\*\* , properties  
 RL: PRP (Properties)  
 (surface inversion layer formation in fluorine- \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* n-type)

IT 14701-13-4, Fluorine(1+), uses and miscellaneous  
 RL: USES (Uses)  
 (surface inversion layer formation in n-type \*\*\*silicon\*\*\*  
 implanted with)

L7 ANSWER 77 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1990:432837 CAPLUS  
 DN 113:32837  
 ED Entered STN: 21 Jul 1990  
 TI Interdiffusion and conversion of indium phosphide/indium gallium  
 arsenide(InP/In<sub>0.53</sub>Ga<sub>0.47</sub>As) superlattices induced by p-type dopants

AU Schwarz, S. A.; Hwang, D. M.; Mei, P.; Schwartz, C. L.; Werner, J.;  
 Stoffel, N. G.; Bhat, R.; Chen, C. Y.; Ravi, T. S.; Koza, M.  
 CS Bellcore, Red Bank, NJ, 07701-7040, USA  
 SO Journal of Vacuum Science & Technology, A: Vacuum, Surfaces, and Films  
 (1990), 8(3, Pt. 2), 2997-3001  
 CODEN: JVTAD6; ISSN: 0734-2101

DT Journal  
 LA English  
 CC 76-3 (Electric Phenomena)  
 Section cross-reference(s): 75

AB Zn diffusion into an unstrained InP/In<sub>0.53</sub>Ga<sub>0.47</sub>As superlattice has been  
 obsd. to result in the formation, first, of a strained layer  
 In<sub>1-x</sub>Ga<sub>x</sub>P/In<sub>1-x</sub>Ga<sub>x</sub>As superlattice due to the selective diffusion of In and  
 Ga, then a Zn<sub>3</sub>P<sub>2</sub>/In<sub>1-x</sub>Ga<sub>x</sub>As superlattice due to "kickout" of the cations,  
 and finally a Zn<sub>3</sub>P<sub>2</sub>/Zn<sub>3</sub>As<sub>2</sub> superlattice. The lateral confinement of Zn  
 induced interdiffusion and conversion is examd. by diffusing through a 3  
 .mu.m period Si<sub>3</sub>N<sub>4</sub> grafting. The effects of Cd diffusion and Be  
 \*\*\*ion\*\*\* \*\*\*implantation\*\*\* are also examd. Organometallic chem.

vapor deposited InP/In<sub>0.53</sub>Ga<sub>0.47</sub>As superlattices were diffused at 600 or 650.degree. in sealed ampules with Zn<sub>3</sub>As<sub>2</sub> or Cd<sub>3</sub>P<sub>2</sub> powder as the dopant source. Samples were examd. by secondary ion mass spectrometry and anal. electron microscopy. In the \*\*\*grating\*\*\* expt., cation homogenization resulted in the formation of a uniform unconfined strained layer superlattice with superior surface quality in the regions protected by Si<sub>3</sub>Nf. Zn<sub>3</sub>P<sub>2</sub> superlattice conversion was confined within the \*\*\*grating\*\*\* window regions; however, a thick, unconfined Zn<sub>3</sub>P<sub>2</sub> layer was obsd. to form below the superlattice. A Ga concn. spike was present between this thick Zn<sub>3</sub>P<sub>2</sub> layer and the underlying substrate. Cd was less efficient at intermixing the superlattice, owing largely to its relative low soly. and diffusion coeff. Partial intermixing was induced by Be implantation, with Be segregation into the InP layers obsd. near the implant peak.

ST indium phosphide superlattice zinc diffusion; gallium indium arsenide superlattice; interdiffusion conversion superlattice; cadmium doping beryllium implantation superlattice  
IT Diffusion  
(of zinc or cadmium, in gallium indium arsenide-indium phosphide superlattices, conversion in relation to)  
IT Diffusion  
(inter-, in gallium indium arsenide-indium phosphide superlattices)  
IT 7440-43-9, Cadmium, properties  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(diffusion of, in gallium indium arsenide-indium phosphide superlattice)  
IT 7440-55-3, Gallium, properties 7440-66-6, Zinc, properties 7440-74-6, Indium, properties  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(diffusion of, in gallium indium arsenide-indium phosphide superlattices)  
IT 55965-40-7, Cadmium phosphide  
RL: USES (Uses)  
(formation of superlattice contg., during cadmium diffusion in gallium indium arsenide-indium phosphide superlattice)  
IT 56450-43-2, Zinc arsenide  
RL: USES (Uses)  
(formation of superlattice contg., in indium gallium arsenide-indium phosphide system, during zinc diffusion)  
IT 106312-00-9P, Gallium indium phosphide ((Ga,In)P)  
RL: FORM (Formation, nonpreparative); PREP (Preparation)  
(formation of, in conversion of indium gallium arsenide-indium phosphide superlattices)  
IT 7440-41-7, Beryllium, uses and miscellaneous  
RL: USES (Uses)  
(implantation of, in gallium indium arsenide-indium phosphide superlattice)  
IT 12033-89-5, \*\*\*Silicon\*\*\* nitride, properties  
RL: PRP (Properties)  
(protection by, of indium phosphide-gallium indium arsenide superlattice)  
IT 22398-80-7, Indium phosphide, properties  
RL: PRP (Properties)  
(superlattice of, with gallium indium arsenide, interdiffusion and conversion in)  
IT 106097-59-0, Gallium indium arsenide (Ga<sub>0.47</sub>In<sub>0.53</sub>As)  
RL: USES (Uses)  
(superlattice of, with indium phosphide, interdiffusion and conversion in)

L7 ANSWER 78 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1989:643487 CAPLUS  
DN 111:243487  
ED Entered STN: 23 Dec 1989  
TI A novel GRIN-SCH-SQW laser diode monolithically integrated with low-loss passive waveguides  
AU Hirata, Takaaki; Maeda, Minoru; Hosomatsu, Haruo  
CS Cent. Res. Lab., Opt. Meas. Technol. Dev. Co., Ltd., Musashino, 180, Japan  
SO Japanese Journal of Applied Physics, Part 2: Letters (1989), 28(8), L1429-L1432  
CODEN: JAPL D8; ISSN: 0021-4922  
DT Journal

LA English  
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
Section cross-reference(s): 76  
AB A fabrication process was proposed for monolithic multielement graded-index (GRIN) sep.-confinement heterostructure (SCH) single quantum well (SQW) laser diodes, and the performance was demonstrated of a monolithically integrated passive waveguide laser as compared with a conventional laser fabricated under the same procedures. This process, which is based on \*\*\*Si\*\*\* \*\*\*ion\*\*\* \*\*\*implantation\*\*\* and 2-step metalorg. VPE growth, is suitable for integrating optical elements like \*\*\*gratings\*\*\* and rib waveguides. The catastrophic optical damage level of the window structure laser fabricated by this process is >1.3 W in pulsed operation.  
ST laser \*\*\*silicon\*\*\* quantum well waveguide  
IT Lasers  
(aluminum gallium arsenide/gallium arsenide, integrated-waveguide, fabrication of)  
IT Luminescence  
(of aluminum gallium arsenide/gallium arsenide single quantum well-integrated waveguide)  
IT Epitaxy  
(vapor-phase, metalorg., fabrication of aluminum gallium arsenide/gallium arsenide waveguide lasers by)  
IT 7440-21-3D, \*\*\*Silicon\*\*\*, \*\*\*ions\*\*\*, uses and miscellaneous  
RL: USES (Uses)  
(\*\*\*implantation\*\*\* of, in fabrication of aluminum gallium arsenide/gallium arsenide waveguide lasers)  
IT 106070-09-1, Aluminum gallium arsenide (Al<sub>0.3</sub>Ga<sub>0.7</sub>As) 106804-30-2, Aluminum gallium arsenide (Al<sub>0.6</sub>Ga<sub>0.4</sub>As)  
RL: DEV (Device component use); USES (Uses)  
(lasers contg., fabrication of integrated-waveguide)  
IT 1303-00-0, Gallium arsenide, uses and miscellaneous 37382-15-3, Aluminum gallium arsenide (Al<sub>0.1</sub>Ga<sub>0.9</sub>As)  
RL: PRP (Properties)  
(lasers from, fabrication of integral-waveguide)  
L7 ANSWER 79 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1989:636568 CAPLUS  
DN 111:236568  
ED Entered STN: 23 Dec 1989  
TI Concepts for thin-film gallium arsenide concentrator cells  
AU Spitzer, M. B.; Gale, R. P.; McClelland, R.; King, B.; Dingle, J.; Morrison, R.  
CS Kopin Corp., Taunton, MA, 02780, USA  
SO Proceedings of the Intersociety Energy Conversion Engineering Conference (1989), 24th(Vol. 2), 785-90  
CODEN: PIECDE; ISSN: 0146-955X  
DT Journal  
LA English  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 75, 76  
AB The development of advanced GaAs concentrator solar cells is described with emphasis on the use of CLEFT (cleavage of lateral epitaxial films for transfer) processes for the formation of thin-film structures and back surface grids. Patterned junction development is described; such junctions are useful in back surface application requiring point-contacts, \*\*\*grating\*\*\* structures, and inter-digitated back contacts. Concentrator solar cells with grids on the front and back surfaces fabricated using CLEFT are reported for the first time; the cells are 4 .mu.m thick and are bonded to glass covers for support. An energy conversion efficiency of 18.8% (air mass 0) was attained by a CLEFT concentrator operating at 18.5 suns.  
ST gallium arsenide concentrator solar cell; crystal growth CLEFT process solar cell  
IT Luminescence  
(lifetime of, of gallium arsenide solar cells, thickness and doping effects on)  
IT Epitaxy  
(of gallium arsenide films, by cleavage of lateral epitaxial films for transfer process, solar cell fabrication by)  
IT Photoelectric devices, solar

(concentrators, gallium arsenide, fabricated by cleavage of lateral epitaxial films for transfer process)

IT 7440-21-3, \*\*\*Silicon\*\*\* , uses and miscellaneous 7440-41-7, Beryllium, uses and miscellaneous 7440-66-6, Zinc, uses and miscellaneous  
 RL: USES (Uses)  
 (gallium arsenide \*\*\*doped\*\*\* with, by \*\*\*ion\*\*\*  
 \*\*\*implantation\*\*\* , solar cell performance in relation to)

IT 37382-15-3P, Aluminum gallium arsenide [(Al,Ga)As] 1303-00-0P, Gallium arsenide, uses and miscellaneous  
 RL: PREP (Preparation)  
 (photoelec. solar cells, prepd. by cleavage of lateral epitaxial films for transfer process)

L7 ANSWER 80 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1989:488575 CAPLUS  
 DN 111:88575  
 ED Entered STN: 03 Sep 1989  
 TI Study of carrier dynamics and radiation defects in \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* by transient \*\*\*grating\*\*\*  
 techniques  
 AU Jonikas, L.; Jarasiunas, K.; Vaitkus, J.  
 CS V. Kapsukas State Univ., Vilnius, SU-232000, USSR  
 SO Physica Status Solidi A: Applied Research (1989), 112(1), 375-80  
 CODEN: PSSABA; ISSN: 0031-8965  
 DT Journal  
 LA English  
 CC 76-5 (Electric Phenomena)  
 Section cross-reference(s): 75

AB Investigations of photoelec. properties of \*\*\*ion\*\*\* - \*\*\*implanted\*\*\*  
 \*\*\*Si\*\*\* were performed by the optical-transient \*\*\*grating\*\*\*  
 technique. A lowering of carrier and thermal diffusion as well as faster recombination are obsd. The existence of elec. active radiation defects in a region essentially exceeding the projected mean range of ions is proved by measurements of both light diffraction and photocond.

ST photocond \*\*\*ion\*\*\* \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* ; carrier  
 \*\*\*ion\*\*\* \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* ; defect \*\*\*ion\*\*\*  
 \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* ; recombination \*\*\*ion\*\*\*  
 \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* ; light diffraction \*\*\*ion\*\*\*  
 \*\*\*implanted\*\*\* \*\*\*silicon\*\*\*

IT Electric current carriers  
 (dynamics of, in phosphorus- \*\*\*ion\*\*\* - \*\*\*implanted\*\*\*  
 \*\*\*silicon\*\*\* )

IT Photoconductivity and Photoconduction  
 Recombination of electron with hole  
 (of \*\*\*silicon\*\*\* after phosphorus \*\*\*ion\*\*\*  
 \*\*\*implantation\*\*\* )

IT 7723-14-0D, Phosphorus, ions, properties  
 RL: PRP (Properties)  
 (current carrier dynamics and radiation defects in \*\*\*silicon\*\*\*  
 implanted with)

IT 7440-21-3, \*\*\*Silicon\*\*\* , properties  
 RL: PRP (Properties)  
 (photocond. and radiation defects in \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* )

L7 ANSWER 81 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1989:486862 CAPLUS  
 DN 111:86862  
 ED Entered STN: 03 Sep 1989  
 TI DBR laser with nondynamic plasma \*\*\*grating\*\*\* formed by focused  
 \*\*\*ion\*\*\* beam \*\*\*implanted\*\*\* \*\*\*dopants\*\*\*

AU Boenke, Myra M.; Wu, M. C.; Wang, Shyh; Clark, William M., Jr.; Stevens, Eugene H.; Utlaut, Mark W.  
 CS Dep. Electr. Eng. Comput. Sci., Univ. California, Berkeley, CA, 94720, USA  
 SO IEEE Journal of Quantum Electronics (1989), 25(6), 1294-302  
 CODEN: IEJQA7; ISSN: 0018-9197  
 DT Journal  
 LA English  
 CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB A static plasma \*\*\*grating\*\*\* was demonstrated exptl. in a large-optical-cavity focused- \*\*\*ion\*\*\* -beam- \*\*\*implanted\*\*\*



distributed-Bragg-reflector (FIB-DBR) GaAlAs/GaAs laser diode. The \*\*\*grating\*\*\* is formed by implanting stripes of dopants with a FIB. The dopants ionize to form periodic fluctuations in the carrier concn. which, through the Kramers-Kronig relations, form an index \*\*\*grating\*\*\*. A model of the \*\*\*grating\*\*\* strength for optimization of the laser design is developed and presented. The computed results show that  $\kappa$  can be increased by more than an order of magnitude over the 15 cm<sup>-1</sup> estd. exptl. Therefore, FIB-DBR (or -DFB) lasers with performance comparable to that of conventional DBR (or DFB) lasers can be expected.

ST laser nondynamic plasma \*\*\*grating\*\*\* ; aluminum gallium arsenide laser plasma \*\*\*grating\*\*\*

IT Diffraction \*\*\*gratings\*\*\*  
(plasma, laser with nondynamic, formed by focused \*\*\*ion\*\*\* beam  
\*\*\*implantation\*\*\* )

IT Lasers  
(semiconductor, with nondynamic plasma \*\*\*grating\*\*\* , focused  
\*\*\*ion\*\*\* beam \*\*\*implantation\*\*\* in fabrication of)

IT 1303-00-0, Gallium arsenide, uses and miscellaneous  
RL: USES (Uses)  
(lasers from aluminum gallium arsenide and, with nondynamic plasma  
\*\*\*grating\*\*\* )

IT 106070-09-1, Aluminum gallium arsenide (Al<sub>0.3</sub>Ga<sub>0.7</sub>As) 106070-12-6,  
Aluminum gallium arsenide (Al<sub>0.15</sub>Ga<sub>0.85</sub>As)  
RL: DEV (Device component use); USES (Uses)  
(lasers from gallium arsenide and, with nondynamic plasma  
\*\*\*grating\*\*\* )

IT 7440-21-3, \*\*\*Silicon\*\*\* , uses and miscellaneous  
RL: USES (Uses)  
(lasers with nondynamic plasma \*\*\*grating\*\*\* formed by focused  
\*\*\*ion\*\*\* beam \*\*\*implanted\*\*\* )

L7 ANSWER 82 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1989:124782 CAPLUS  
DN 110:124782  
ED Entered STN: 03 Apr 1989  
TI Reflectivity and dynamic \*\*\*gratings\*\*\* in implanted \*\*\*silicon\*\*\*  
induced by picosecond laser pulses  
AU Galeckas, A.; Netiksis, V.; Petrauskas, M.; Vaitkus, J.  
CS Vilnius State Univ., Vilnius, SU-232 054, USSR  
SO Physica Status Solidi B: Basic Research (1988), 150(2), 743-8  
CODEN: PSSBBD; ISSN: 0370-1972  
DT Journal  
LA English  
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related  
Properties)  
Section cross-reference(s): 76  
AB The relaxation processes are investigated in high-excited P<sup>+</sup>- and  
B<sup>+</sup>-implanted \*\*\*Si\*\*\* using transient-reflectivity and dynamic  
\*\*\*grating\*\*\* methods in the ps time domain. The dependence of the  
optical parameters of \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*Si\*\*\* vs.  
\*\*\*implantation\*\*\* dose are presented. The temporal behavior of the  
nonequil. charge carriers obtained from the induced-reflectivity change  
and \*\*\*grating\*\*\* decay measurements was analyzed. The reflectivity  
decay process is always faster than the corresponding \*\*\*grating\*\*\*  
decay process. By the numerical calcns. the surface recombination  
velocity, S = 4 .times. 10<sup>4</sup> cm/s, was estd. The influence of the  
implantation process on the effective carrier lifetime is discussed.

ST relaxation nonlinear boron implanted \*\*\*silicon\*\*\* ; phosphorus  
implanted \*\*\*silicon\*\*\* nonlinear reflection; boron implanted  
\*\*\*silicon\*\*\* nonlinear reflection

IT Diffraction \*\*\*gratings\*\*\*  
(in \*\*\*silicon\*\*\* implanted with phosphorus and boron cations)

IT Optical reflection  
(nonlinear, of \*\*\*silicon\*\*\* implanted with phosphorus and boron  
cations)

IT Electric current carriers  
(nonequil., relaxation of, in \*\*\*silicon\*\*\* implanted with  
phosphorus and boron cations)

IT Optical nonlinear property  
(reflection, of \*\*\*silicon\*\*\* implanted with phosphorus and boron  
cations)

IT 7440-21-3, \*\*\*Silicon\*\*\* , uses and miscellaneous

RL: USES (Uses)  
 (nonlinear optical reflectivity and dynamic \*\*\*gratings\*\*\* in  
 \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* )  
 IT 14594-80-0, Boron(1+), uses and miscellaneous 16427-80-8,  
 Phosphorus(1+), uses and miscellaneous  
 RL: USES (Uses)  
 (nonlinear optical reflectivity and dynamic \*\*\*gratings\*\*\* in  
 \*\*\*silicon\*\*\* implanted with)

L7 ANSWER 83 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1989:123976 CAPLUS  
 DN 110:123976  
 ED Entered STN: 03 Apr 1989  
 TI Transient \*\*\*gratings\*\*\* in metrology of semiconductor parameters and  
 optoelectronic devices  
 AU Jarasiunas, K.; Vaitkus, J.  
 CS Dep. Phys., Vilnius State Univ., Vilnius, SU-232 054, USSR  
 SO Physica Status Solidi B: Basic Research (1988), 150(2), 879-84  
 CODEN: PSSBBD; ISSN: 0370-1972  
 DT Journal; General Review  
 LA English  
 CC 73-0 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)  
 Section cross-reference(s): 76  
 AB A review with 26 refs. The origin of optical nonlinearity and its  
 magnitude were investigated in different semiconductors and structures, as  
 CdSe, GaAs, InSb, \*\*\*Si\*\*\* (pure, \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* ,  
 heavily \*\*\*doped\*\*\* or amorphous) MQWS. The usefulness of the  
 transient \*\*\*grating\*\*\* technique studies peculiarities of the  
 nonequil. processes in strong elec. fields, at high excitation levels, or  
 reveals the presence and transformation of defects. Some novel  
 possibilities for the deflection of a laser beam and its modulation are  
 demonstrated.  
 ST metrol semiconductor transient \*\*\*grating\*\*\* review; optoelectronic  
 device metrol \*\*\*grating\*\*\* review  
 IT Semiconductor materials  
 (transient \*\*\*gratings\*\*\* in metrol. of)  
 IT Measurement  
 (transient \*\*\*gratings\*\*\* in, of semiconductor parameters and  
 optoelectronic devices)  
 IT Diffraction \*\*\*gratings\*\*\*  
 (transient, in metrol. of semiconductor parameters and optoelectronic  
 devices)  
 IT Optical instruments  
 (electro-, transient \*\*\*gratings\*\*\* in metrol. of)

L7 ANSWER 84 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1988:519191 CAPLUS  
 DN 109:119191  
 ED Entered STN: 01 Oct 1988  
 TI Gallium arsenide/gallium aluminum arsenide distributed Bragg reflector  
 laser with a focused \*\*\*ion\*\*\* beam, low dose \*\*\*dopant\*\*\*  
 \*\*\*implanted\*\*\* \*\*\*grating\*\*\*  
 AU Wu, M. C.; Boenke, M. M.; Wang, S.; Clark, W. M., Jr.; Stevens, E. H.;  
 Utlaut, M. W.  
 CS Dep. Electr. Eng. Comp. Sci., Univ. California, Berkeley, CA, 94720, USA  
 SO Applied Physics Letters (1988), 53(4), 265-7  
 CODEN: APPLAB; ISSN: 0003-6951  
 DT Journal  
 LA English  
 CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)  
 AB The performance is reported of a GaAs/GaAlAs distributed Bragg reflector  
 (DBR) laser using a focused \*\*\*ion\*\*\* beam \*\*\*implanted\*\*\*  
 \*\*\*grating\*\*\* (FIB-DBR). Stripes of \*\*\*Si\*\*\* ++ with a period of  
 2300 .ANG. and a dose .apprx.1014 cm-2 are directly implanted into the  
 passive large optical cavity layer to provide the distributed feedback.  
 Surface-emitting light from the 2nd-order \*\*\*grating\*\*\* is obsd.  
 Threshold current of 110 mA and single DBR mode operation from 20 to  
 40.degree. are obtained. The wavelength tuning rate with temp. is 0.8  
 .ANG./degree.. The coupling coeff. is estd. to be 15 cm-1. The results  
 show that FIB technol. is practical for distributed feedback and DBR

lasers and optoelectronic integrated circuits.

ST aluminum gallium arsenide Bragg reflector laser; \*\*\*silicon\*\*\*  
 implanted \*\*\*grating\*\*\* laser

IT Lasers  
 (aluminum gallium arsenide-gallium arsenide, distributed Bragg  
 reflector, with dopant implanted \*\*\*grating\*\*\* )

IT Diffraction \*\*\*gratings\*\*\*  
 (dopant implanted, for aluminum gallium arsenide-gallium arsenide  
 distributed Bragg reflector laser)

IT 1303-00-0, Gallium arsenide, uses and miscellaneous  
 RL: USES (Uses)  
 (lasers from aluminum gallium arsenide and, distributed Bragg  
 reflector)

IT 14175-55-4, \*\*\*Silicon\*\*\* (2+), uses and miscellaneous  
 RL: USES (Uses)  
 (lasers from aluminum gallium arsenide-gallium arsenide with  
 \*\*\*grating\*\*\* doped with, distributed Bragg reflector)

IT 106070-09-1, Aluminum gallium arsenide (Al<sub>0.3</sub>Ga<sub>0.7</sub>As) 106070-12-6,  
 Aluminum gallium arsenide (Al<sub>0.15</sub>Ga<sub>0.85</sub>As)  
 RL: DEV (Device component use); USES (Uses)  
 (lasers from gallium arsenide and, distributed Bragg reflector)

L7 ANSWER 85 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1988:463914 CAPLUS  
 DN 109:63914  
 ED Entered STN: 19-Aug 1988

TI Study of nanosecond laser annealing of \*\*\*ion\*\*\* - \*\*\*doped\*\*\*  
 \*\*\*silicon\*\*\* by the method of picosecond lattices

AU Baltramejunas, R.; Gaska, R.; Kuokstis, E.; Natiksis, V.; Petrauskas, M.  
 CS USSR  
 SO Lazery i Optich. Nelineinost, Vil'nyus (1987) 230-5  
 From: Ref. Zh., Fiz. (A-Zh.) 1988, Abstr. No. 2L1412

DT Journal  
 LA Russian  
 CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)

AB Title only translated.

ST laser annealing \*\*\*ion\*\*\* \*\*\*implantation\*\*\* \*\*\*silicon\*\*\* ;  
 diffraction lattice \*\*\*ion\*\*\* \*\*\*implantation\*\*\* \*\*\*silicon\*\*\*

IT Laser radiation, chemical and physical effects  
 (annealing by, of \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* )

IT \*\*\*Ion\*\*\* beams  
 ( \*\*\*implantation\*\*\* of, in \*\*\*silicon\*\*\* , laser annealing in  
 relation to)

IT Diffraction \*\*\*gratings\*\*\*  
 (laser-induced, picosecond, in laser-annealed \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* )

IT 7440-21-3, \*\*\*Silicon\*\*\* , properties  
 RL: PRP (Properties)  
 (laser annealing of \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* )

L7 ANSWER 86 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1988:194832 CAPLUS  
 DN 108:194832  
 ED Entered STN: 28 May 1988

TI Fabrication of index-guided aluminum gallium arsenide multi-quantum well  
 lasers and \*\*\*grating\*\*\* structures by \*\*\*silicon\*\*\* -induced  
 disordering

AU Nakashima, Hisao; Ishida, Koji  
 CS Inst. Sci. Ind. Res., Osaka Univ., Ibaraki, 567, Japan  
 SO Optoelectronics--Devices and Technologies (1987), 2(2), 235-45  
 CODEN: ODTEEG; ISSN: 0912-5434

DT Journal; General Review  
 LA English  
 CC 73-0 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)

AB A review with 24 refs. is given on the application of compositional  
 disordering of multiquantum yield (MQW) to the fabrication of transverse  
 mode controlled AlGaAs MQW lasers and submicron \*\*\*grating\*\*\*  
 structures using conventional and focused \*\*\*ion\*\*\* beam  
 \*\*\*implantation\*\*\* technique. This simple, controllable and reliable  
 technique is expected to be very useful for making optoelectronic

integrated circuits.  
ST review aluminum gallium arsenide laser \*\*\*grating\*\*\*  
IT Diffraction \*\*\*gratings\*\*\*  
Lasers  
(aluminum gallium arsenide, fabrication by \*\*\*silicon\*\*\* -induced  
disordering)  
IT Order  
(disorder, \*\*\*silicon\*\*\* -induced, in fabrication of aluminum  
gallium arsenide lasers and \*\*\*grating\*\*\* structures)  
IT 7440-21-3, \*\*\*Silicon\*\*\*, uses and miscellaneous  
RL: USES (Uses)  
(disordering induced by, in fabrication of aluminum gallium arsenide  
lasers and \*\*\*grating\*\*\* structures)  
IT 37382-15-3, Aluminum gallium arsenide ((Al,Ga)As)  
RL: PRP (Properties)  
(lasers and \*\*\*grating\*\*\* structures, fabrication by  
\*\*\*silicon\*\*\* -induced disordering)

L7 ANSWER 87 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1987:408196 CAPLUS  
DN 107:8196  
ED Entered STN: 11 Jul 1987  
TI XPS and SSIMS (FABMS) studies on silane treated filler surfaces  
AU Garbassi, F.; Occhiello, E.; Bastioli, C.; Romano, G.; Brown, A.  
CS Ist. Guido Donegani S.p.A., Cent. Ric. Novara, Novara, 28100, Italy  
SO Compos. Interfaces, Proc. Int. Conf., 1st (1986), 241-50. Editor(s):  
Ishida, Hatsuo; Koenig, Jack L. Publisher: North-Holland, New York, N. Y.  
CODEN: 55VAAZ  
DT Conference  
LA English  
CC 37-6 (Plastics Manufacture and Processing)  
AB Using XPS and static secondary- \*\*\*ion\*\*\* mass spectrometry (fast-atom  
\*\*\*bombardment\*\*\* mass spectroscopy), a qual. and semiquant. picture was  
obtained of the bonding of 3-(methacryloyloxy)propyltrimethoxysilane to  
E-glass, alumina and quartz. On E-glass and alumina the silane did not  
form significant amts. of polymethacrylate. The coverage was higher on  
E-glass, probably as a consequence of the higher amt. of polar groups.  
One of the silanol OH groups was often not used in the formation of  
\*\*\*Si\*\*\* -O- \*\*\*Si\*\*\* bridges with the substrate or other silane mols.  
In quartz substantial polymd. silane was noted. Probably polymn. was  
responsible for the high coverage found on quartz, where there was also  
obsd. a distinct excess of nonoxygen-bonded carbon in the XPS C-1s  
spectrum of the silane, suggesting that polar functions stayed  
preferentially below the surface to minimize surface energy.

ST silane \*\*\*coupler\*\*\* glass XPS; quartz silane \*\*\*coupler\*\*\*  
polymn; alumina silane \*\*\*coupler\*\*\* mass spectra; methacrylate silane  
\*\*\*coupler\*\*\* polymn  
IT Polymerization  
(of methacryloyloxysilane on filler surfaces, XPS and mass  
spectroscopic studies of)  
IT Coupling agents  
(silane, glass, alumina and quartz surfaces treated with, XPS and mass  
spectroscopy study of)  
IT 2530-85-0, 3-(Methacryloyloxy)propyltrimethoxysilane  
RL: USES (Uses)  
(glass, quartz and alumina surfaces treated with, XPS and mass  
spectroscopic studies on)  
IT 1344-28-1, Alumina, properties 14808-60-7, Quartz, properties  
RL: PRP (Properties)  
(silane-treated, XPS and mass spectroscopic studies of)

L7 ANSWER 88 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1987:204898 CAPLUS  
DN 106:204898  
ED Entered STN: 13 Jun 1987  
TI Fabrication of submicron \*\*\*grating\*\*\* patterns using compositional  
disordering of aluminum gallium arsenide-gallium arsenide superlattices by  
focused \*\*\*silicon\*\*\* \*\*\*ion\*\*\* beam \*\*\*implantation\*\*\*  
AU Ishida, Koji; Miyauchi, Eizo; Morita, Tetsuo; Takamori, Takeshi; Fukunaga,  
Toshiaki; Hashimoto, Hisao; Nakashima, Hisao  
CS Optoelectron. Jt. Res. Lab., Kawasaki, 211, Japan  
SO Japanese Journal of Applied Physics, Part 2: Letters (1987), 26(4),

L285-L287  
CODEN: JAPLD8  
DT Journal  
LA English  
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
AB Submicron \*\*\*grating\*\*\* patterns (0.4 .mu.m period) were fabricated in AlGaAs-GaAs superlattices (SL's) using compositional disordering of the SL's by focused \*\*\*Si\*\*\* \*\*\*ion\*\*\* beam \*\*\*implantation\*\*\* and subsequent annealing. The \*\*\*grating\*\*\* structure which is composed of preserved SL and mixed (disordered) regions was confirmed by SEM and scanning Auger microscopic observations.  
ST aluminum gallium arsenide superlattice \*\*\*grating\*\*\* ; submicron \*\*\*grating\*\*\* superlattice compn disordering  
IT Diffraction \*\*\*gratings\*\*\*  
(fabrication of, with submicron patterns using compositional disordering in superlattice by \*\*\*silicon\*\*\* \*\*\*ion\*\*\* beam \*\*\*implantation\*\*\* )  
IT Order  
(disorder, compn. of, in superlattices, submicron \*\*\*grating\*\*\* patterns in relation to)  
IT 14067-07-3, \*\*\*Silicon\*\*\* (1+), uses and miscellaneous  
RL: USES (Uses)  
(compositional disordering of superlattice by implantation with, fabrication of submicron \*\*\*grating\*\*\* patterns in relation to)  
IT 12774-40-2  
RL: PRP (Properties)  
(submicron \*\*\*grating\*\*\* pattern fabrication in superlattice contg., by \*\*\*silicon\*\*\* \*\*\*ion\*\*\* \*\*\*implantation\*\*\* induced compositional disordering)  
IT 1303-00-0, Gallium arsenide, uses and miscellaneous  
RL: USES (Uses)  
(submicron \*\*\*grating\*\*\* pattern fabrication in superlattice of aluminum gallium arsenide with, by \*\*\*silicon\*\*\* \*\*\*ion\*\*\* \*\*\*implantation\*\*\* induced compositional disordering)  
L7 ANSWER 89 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1986:616831 CAPLUS  
DN 105:216831  
ED Entered STN: 13 Dec 1986  
TI Crystalline films on amorphous substrates by zone melting and surface-energy-driven grain growth in conjunction with patterning  
AU Smith, Henry I.; Geis, M. W.; Thompson, C. V.; Chen, C. K.  
CS Dep. Electr. Eng. Comput. Sci., Massachusetts Inst. Technol., Cambridge, MA, 02139, USA  
SO Materials Research Society Symposium Proceedings (1986), 53(Semicond. Insul. Thin Film Transistor Technol.), 3-13  
CODEN: MRSPDH; ISSN: 0272-9172  
DT Journal; General Review  
LA English  
CC 75-0 (Crystallography and Liquid Crystals)  
Section cross-reference(s): 76  
AB A review with 30 refs. is given on two approaches to prep. oriented cryst. films on amorphous substrates; zone-melting recrystn. (ZMR) and surface-energy-driven grain growth (SEDGG). In both approaches patterning can be employed either to establish orientation or to control the location of defects. ZMR has been highly successful for the growth of \*\*\*Si\*\*\* films on oxidized \*\*\*Si\*\*\* substrates, but its applicability is limited by the high temps. required. SEDGG has been investigated as a potentially universal, low temp. approach. It has been demonstrated in \*\*\*Si\*\*\*, Ge, and Au. Surface \*\*\*gratings\*\*\* favor the growth of grains with a specific in-plane orientation. For SEDGG to be of broad practical value, the mobility of semiconductor grain boundaries must be increased substantially. Mobility enhancement has been achieved via \*\*\*doping\*\*\* and \*\*\*ion\*\*\* \*\*\*bombardment\*\*\*.  
ST review crystn film amorphous substrate; zone crystn film amorphous substrate review; surface energy oriented film crystn review  
IT Surface energy  
(crystn. of oriented films on amorphous substrate by grain growth driven by)  
IT Films  
(crystn. of oriented, on amorphous substrate by zone-melting recrystn.)

and surface-energy-driven grain growth)

IT Zone crystallization  
(of oriented films, on amorphous substrate)

IT Crystallization  
(of oriented films, on amorphous substrate by surface-energy-driven grain growth)

IT 7440-56-4, properties 7440-57-5, properties  
RL: PRP (Properties)  
(crystn. of oriented films of, on amorphous substrate by surface-energy-driven grain growth)

IT 7440-21-3, properties  
RL: PRP (Properties)  
(crystn. of oriented films of, on amorphous substrate by zone-melting recrystn. and surface-energy-grain growth)

L7 ANSWER 90 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1986:542324 CAPLUS  
DN 105:142324

ED Entered STN: 18 Oct 1986

TI The diffraction of light by transient \*\*\*gratings\*\*\* in crystalline, \*\*\*ion\*\*\* - \*\*\*implanted\*\*\*, and amorphous \*\*\*silicon\*\*\*

AU Vaitkus, J.; Jarasiunas, K.; Gaubas, E.; Jonikas, L.; Pranaitis, R.; Subacius, L.

CS Dep. Semicond. Phys., Vilnius V. Kapsukas State Univ., Vilnius, 232054, USSR

SO IEEE Journal of Quantum Electronics (1986), QE-22(8), 1298-1305  
CODEN: IEJQA7; ISSN: 0018-9197

DT Journal  
LA English  
CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB The results of the transient \*\*\*grating\*\*\* technique applied to single crystals of \*\*\*Si\*\*\* were analyzed by taking into account free carrier absorption and nonlinear recombination. By using different configurations of this technique, the exposure and decay characteristics of \*\*\*gratings\*\*\* in the vol. or surface of \*\*\*Si\*\*\* of different properties (pure, \*\*\*doped\*\*\* with deep or shallow traps, \*\*\*ion\*\*\* \*\*\*implanted\*\*\*, or amorphous) were investigated. The presence of impurities does not change the dominant mechanism of n modulation by the photogenerated nonequil. carriers. Increased damage of \*\*\*Si\*\*\* leads to a decrease in carrier diffusion (implanted \*\*\*Si\*\*\* ) with, in the case of amorphous \*\*\*Si\*\*\*, domination of \*\*\*grating\*\*\* decay by carrier recombination. The properties of \*\*\*gratings\*\*\* in high external d.c. or a.c. (microwave) elec. fields enables one to evaluate hot carrier diffusion coeffs.

ST optical diffraction transient \*\*\*grating\*\*\* \*\*\*silicon\*\*\*

IT Optical diffraction  
(by transient \*\*\*gratings\*\*\* in cryst. and \*\*\*ion\*\*\* \*\*\*implanted\*\*\* or amorphous \*\*\*silicon\*\*\* )

IT Electric current carriers  
(diffusion coeffs. of, in \*\*\*silicon\*\*\* )

IT Diffraction \*\*\*gratings\*\*\*  
(transient, in cryst. and \*\*\*ion\*\*\* \*\*\*implanted\*\*\* and amorphous \*\*\*silicon\*\*\* )

IT 7440-21-3, properties  
RL: PRP (Properties)  
(optical diffraction by transient \*\*\*gratings\*\*\* in cryst. or \*\*\*ion\*\*\* \*\*\*implanted\*\*\* or hydrogenated amorphous)

IT 7440-42-8, properties 7440-57-5, properties 7723-14-0, properties 12385-13-6, properties  
RL: PRP (Properties)  
(optical diffraction by transient \*\*\*gratings\*\*\* in \*\*\*silicon\*\*\* contg.)

L7 ANSWER 91 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1986:469861 CAPLUS  
DN 105:69861

ED Entered STN: 23 Aug 1986

TI Optical wave-guiding components

IN Strain, Robert J.

PA Fairchild Semiconductor Corp., USA

SO U.S., 9 pp.

CODEN: USXXAM

DT Patent

LA English

IC ICM G02B006-10  
ICS H01L021-22; H01L031-00; B44C001-22

INCL 350096120

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4585299	A	19860429	US 1983-515112	19830719
PRAI	US 1983-515112		19830719		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 4585299	ICM	G02B006-10
	ICS	H01L021-22; H01L031-00; B44C001-22
	INCL	350096120
	IPCI	G02B0006-10 [ICM,4]; H01L0021-22 [ICS,4]; H01L0031-00 [ICS,4]; B44C0001-22 [ICS,4]
	NCL	385/132.000; 216/002.000; 216/024.000; 216/079.000; 385/014.000; 438/031.000; 438/045.000; 438/449.000

AB Optical wave-guiding components and a process for fabricating them in a substrate using conventional integrated circuit fabrication techniques are claimed. \*\*\*Ions\*\*\* of a suitable \*\*\*dopant\*\*\* (e.g., B, P, As, or Ge) are selectively implanted in a \*\*\*Si\*\*\* substrate to create an interior region defining a wave-guiding region with a 1st index of refraction. A wave confining region surrounding the wave-guiding region is created by oxidizing the \*\*\*Si\*\*\* substrate, which has a 2nd index of refraction lower than the 1st index of refraction. Various configurations of components, from which various optical component characteristics (e.g., for optical attenuators, \*\*\*couplers\*\*\*, and terminators) can be obtained, are disclosed. The optical components also may be combined with electronic circuit components (e.g., a diode, to form an optical detector) formed on the same substrate.

ST optical waveguide fabrication \*\*\*silicon\*\*\* substrate; \*\*\*ion\*\*\*

IT \*\*\*implantation\*\*\* optical waveguide fabrication

IT \*\*\*Ion\*\*\* beams

IT ( \*\*\*implantation\*\*\* by, in optical waveguide fabrication in \*\*\*silicon\*\*\* substrates)

IT Waveguides

IT (optical, fabrication of, in \*\*\*silicon\*\*\* substrates)

IT Diodes

IT (photo-, \*\*\*silicon\*\*\*, optical waveguide fabrication on substrate with)

IT Optical detectors

IT (semiconductive, with integral optical waveguides)

IT 7440-38-2, uses and miscellaneous 7440-42-8, uses and miscellaneous  
7440-56-4, uses and miscellaneous 7723-14-0, uses and miscellaneous  
RL: USES (Uses)  
(implantation of, in optical waveguide fabrication in \*\*\*silicon\*\*\* substrates)

IT 12033-89-5, uses and miscellaneous  
RL: USES (Uses)  
(in optical waveguide fabrication in \*\*\*silicon\*\*\* substrates)

IT 7631-86-9, uses and miscellaneous  
RL: USES (Uses)  
(optical waveguide confining region of, on \*\*\*silicon\*\*\* substrate)

IT 7440-21-3, uses and miscellaneous  
RL: USES (Uses)  
(optical waveguide fabrication in substrates of)

L7 ANSWER 92 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1984:540938 CAPLUS

DN 101:140938

ED Entered STN: 13 Oct 1984

TI Change in the dimensions of topology elements of a poly(methyl methacrylate) mask irradiated with medium energy ions

AU Valiev, K. A.; Danilov, V. A.; Makhmutov, R. Kh.; Rakov, A. V.; Filippov, M. N.; Shchuchkin, A. G.

CS Inst. Obshch. Fiz., USSR  
SO Mikroelektronika (1984), 13(3), 277-80  
CODEN: MKETA9; ISSN: 0544-1269

DT Journal  
LA Russian  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
Section cross-reference(s): 38

AB The changes in the dimensions of micron- and submicron-size elements of the topol. of resist masks from 0.54 .mu.m thick poly(Me methacrylate) [9011-14-7] films on \*\*\*Si\*\*\* substrates during \*\*\*bombardment\*\*\* with 100 keV 4He+ \*\*\*ions\*\*\* were detd. for the prepn. of high-precision photopatterns for diffraction \*\*\*gratings\*\*\*. Small changes of dimensions can be compensated by corresponding corrections of the initial dimensions of the masks.

ST polymethyl methacrylate \*\*\*ion\*\*\* \*\*\*bombardment\*\*\*; photoresist stability helium \*\*\*ion\*\*\* \*\*\*bombardment\*\*\*; diffraction \*\*\*grating\*\*\* photodraft polymethyl methacrylate

IT Diffraction \*\*\*gratings\*\*\*  
(fabrication of, changes in topol. dimensions of poly(Me methacrylate) masks during \*\*\*ion\*\*\* \*\*\*bombardment\*\*\* in relation to)

IT Resists  
(photo-, poly(Me methacrylate) as, topol. dimensions of, \*\*\*ion\*\*\* \*\*\*bombardment\*\*\* effect on, for diffraction \*\*\*gratings\*\*\* )

IT 9011-14-7  
RL: USES (Uses)  
(films, photoresists, topol. dimensions of, \*\*\*ion\*\*\* - \*\*\*bombardment\*\*\* effect on, for diffraction \*\*\*gratings\*\*\* )

IT 14234-48-1, properties  
RL: PRP (Properties)  
(topol. dimensions of poly(Me methacrylate) resist bombarded by, for diffraction \*\*\*gratings\*\*\* )

L7 ANSWER 93 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
AN 1984:59536 CAPLUS  
DN 100:59536  
ED Entered STN: 12 May 1984  
TI \*\*\*Silicon\*\*\* nitride stencil masks for high resolution ion lithography proximity printing

AU Randall, J. N.; Flanders, D. C.; Economou, N. P.; Donnelly, J. P.; Bromley, E. I.

CS Lincoln Lab., Massachusetts Inst. Technol., Lexington, MA, 02173, USA  
SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (1983), 1(4), 1152-5  
CODEN: JVTBD9; ISSN: 0734-211X

DT Journal  
LA English  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB Masked ion beam lithog. using \*\*\*Si\*\*\* nitride stencil masks at a 25 .mu.m mask-to-sample gap was used to replicate 80 nm lines and spaces in poly(Me methacrylate). An improved reactive ion etching technique for the \*\*\*Si\*\*\* -rich \*\*\*Si\*\*\* nitride mask material using CHF3 at a 500 V self-bias potential is reported. A grid support mask is proposed as a means of exposing arbitrary patterns with a stencil mask. The principle of this technique is demonstrated in the special case of a \*\*\*grating\*\*\*.

ST \*\*\*silicon\*\*\* nitride mask ion lithog

IT Electron beam, chemical and physical effects  
(in high-resoln. ion lithog. using poly(methylacrylate) film, \*\*\*silicon\*\*\* nitride stencil mask for)

IT Resists  
( \*\*\*silicon\*\*\* nitride mask, for high-resoln. ion lithog., reactive ion etching technique for)

IT Stencils  
( \*\*\*silicon\*\*\* nitride, as mask for high-resoln. ion lithog.)

IT Lithography  
(ion-beam, \*\*\*silicon\*\*\* nitride stencil mask for high-resoln.)

IT Etching  
(ion-beam, reactive, of \*\*\*silicon\*\*\* nitride stencil mask for high resoln. ion lithog.)

IT 12184-90-6, uses and miscellaneous 12586-59-3, chemical and physical



effects 28132-48-1, uses and miscellaneous  
 RL: USES (Uses)  
 (high-resoln. \*\*\*ion\*\*\* lithog. using poly(methylacrylate) film  
 \*\*\*bombarded\*\*\* by, \*\*\*silicon\*\*\* nitride stencil mask for)

IT 75-46-7  
 RL: USES (Uses)  
 (in reactive ion etching of \*\*\*silicon\*\*\* nitride stencil mask)

IT 9011-14-7  
 RL: USES (Uses)  
 ( \*\*\*silicon\*\*\* nitride stencil mask for high resoln. ion lithog.  
 with film of)

L7 ANSWER 94 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1983:603418 CAPLUS  
 DN 99:203418  
 ED Entered STN: 12 May 1984  
 TI \*\*\*Silicon\*\*\* diffraction \*\*\*grating\*\*\* for optical communications  
 PA Oki Electric Industry Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 4 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC G02B005-18  
 ICA H01L021-306  
 CC 73-12 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)  
 Section cross-reference(s): 76

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 58076804	A2	19830510	JP 1981-174412	19811102
PRAI JP 1981-174412		19811102		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 58076804	IC	G02B005-18
	ICA	H01L021-306
	IPCI	G02B0005-18; H01L0021-306 [ICA]

AB A \*\*\*Si\*\*\* diffraction \*\*\*grating\*\*\* useful in optical  
 communication systems is obtained by high concn. \*\*\*ion\*\*\*  
 \*\*\*implantation\*\*\* of a \*\*\*Si\*\*\* wafer with B atoms to form a  
 p+-layer, forming a diffraction \*\*\*grating\*\*\* pattern on the p+-layer  
 via photolithog., etching (e.g. by ion milling) the p+-layer, and etching  
 (e.g. using an amine-type etching soln.) the \*\*\*Si\*\*\* wafer using the  
 p+-layer pattern as a chem. etching resist. A high dispersion angle high  
 performance diffraction \*\*\*grating\*\*\* is obtained.

ST \*\*\*silicon\*\*\* diffraction \*\*\*grating\*\*\* communication  
 IT Diffraction \*\*\*gratings\*\*\*  
 ( \*\*\*silicon\*\*\* , for optical communications)

IT Communication  
 (optical, \*\*\*silicon\*\*\* diffraction \*\*\*grating\*\*\* for)

IT 7440-21-3, uses and miscellaneous  
 RL: USES (Uses)  
 (diffraction \*\*\*grating\*\*\* from boron-contg., for optical  
 communications)

IT 7440-42-8, uses and miscellaneous  
 RL: USES (Uses)  
 (diffraction \*\*\*grating\*\*\* from \*\*\*silicon\*\*\* doped with, for  
 optical communications)

L7 ANSWER 95 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1983:153480 CAPLUS  
 DN 98:153480  
 ED Entered STN: 12 May 1984  
 TI Study of the electrophysical properties of implanted semiconductor layers  
 under laser excitation  
 AU Vaitkus, J.; Gaubas, E.; Grivickas, V.; Jonikas, L.; Pranevicius, L.;  
 Skilinskas, S.; Jarasiunas, K.  
 CS Kaunas A. Snieckus Politech. Inst., Vilnius V. Kapsukas State Univ.,  
 Vilnius, USSR  
 SO Lietuvos Fizikos Rinkinys (1982), 22(6), 86-90  
 CODEN: LFRMA7; ISSN: 0024-2969

DT Journal  
 LA Russian  
 CC 76-5 (Electric Phenomena)  
 Section cross-reference(s): 73  
 AB The possibilities of the application of laser pulse in the study of the electro-phys. characteristics of implanted semiconducting layers are discussed. For illustration, measurements with Ar+-doped n- \*\*\*Si\*\*\* are presented. The sensitivity to implantation dose was detd. Photocond. kinetics were studied for excitation by the radiation of the 2nd harmonic of a YAG laser. A dynamic phase diffraction \*\*\*grating\*\*\* was also used to study the samples. The intensities of the diffraction and photocond upon excitation by ns pulses of a laser are sensitive to a change of the lifetime of carriers in the implanted layer in the region of dose of \*\*\*implantation\*\*\* >10<sup>13</sup> \*\*\*ion\*\*\* /cm<sup>2</sup>. Therefore such a technique is a perspective for detg. the lifetime in implanted layers, since other methods are not sensitive in this region.  
 ST laser excitation semiconductor implantation electrophys; photocond  
 \*\*\*silicon\*\*\* argon implanted laser  
 IT Laser radiation  
 (diffraction of, from \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* semiconductor layers)  
 IT Laser radiation, chemical and physical effects  
 (electrophys. property detn. of implanted semiconductor layers under excitation by)  
 IT \*\*\*Ion\*\*\* beams  
 ( \*\*\*implantation\*\*\* of, in semiconductor layers, laser excitation in study of electrophys. properties in relation to)  
 IT Semiconductor materials  
 (implanted layers, laser excitation in study of electrophys. properties of)  
 IT Electric current carriers  
 (lifetime of, in implanted semiconductor layers under laser excitation)  
 IT Electric property  
 Photoconductivity and Photoconduction  
 Photoelectric property  
 (of implanted semiconductor layers under laser excitation)  
 IT 7440-21-3, properties  
 RL: PRP (Properties)  
 (electrophys. properties of argon \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* layers of, laser excitation in study of)  
 IT 14791-69-6, properties  
 RL: PRP (Properties)  
 (electrophys. properties of \*\*\*silicon\*\*\* contg. implanted, laser excitation in study of)

L7 ANSWER 96 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1982:26736 CAPLUS  
 DN 96:26736  
 ED Entered STN: 12 May 1984  
 TI Diffraction of light on dynamic heterogeneous lattices in semiconductors  
 AU Gaubas, E.; Vaitkus, J.; Jarasiunas, K.  
 CS Vilnius State Univ., Vilnius, USSR  
 SO Lietuvos Fizikos Rinkinys (1981), 21(5), 77-86  
 CODEN: LFRMA7; ISSN: 0024-2969  
 DT Journal  
 LA Russian  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 AB Light diffraction on nonhomogeneities in the direction of light propagation transient free-carrier \*\*\*gratings\*\*\* was analyzed. Calcns. showing the general properties of such \*\*\*gratings\*\*\* are presented. Exptl. investigation of \*\*\*grating\*\*\* are performed on B-\*\*\*ion\*\*\* \*\*\*implanted\*\*\* layers of \*\*\*Si\*\*\* and on CdS, CdSe single crystals in the region of the absorption edge.  
 ST semiconductor diffraction \*\*\*grating\*\*\*  
 IT Semiconductor materials  
 (diffraction \*\*\*gratings\*\*\* based on dynamic heterogeneous lattice)  
 IT Diffraction \*\*\*gratings\*\*\*  
 (semiconductor, dynamic heterogeneous lattice)

L7 ANSWER 97 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1981:106398 CAPLUS

DN 94:106398  
 ED Entered STN: 12 May 1984  
 TI \*\*\*Ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*grating\*\*\* type \*\*\*silicon\*\*\*  
 solar cells: junction depth dependence  
 AU Hwang, H. L.; Liu, D. C.; Tang, R. S.; Kao, Y. R.; Loferski, J. J.  
 CS Natl. Tsing Hua Univ., Hsinchu, Taiwan  
 SO Conference Record of the IEEE Photovoltaic Specialists Conference (1980),  
 14th, 381-5  
 CODEN: CRCNDP; ISSN: 0160-8371  
 DT Journal  
 LA English  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 AB \*\*\*Si\*\*\* \*\*\*grating\*\*\* -type solar cells with the light-receiving  
 surface covered by a finely spaced \*\*\*grating\*\*\* of charge-collection  
 barriers were fabricated by \*\*\*ion\*\*\* \*\*\*implantation\*\*\*. The  
 as-fabricated cells exhibited an open-circuit voltage of 0.54 V, a  
 short-circuit current (air-mass-1, AM1) of 32 mA/cm<sup>2</sup> (without  
 antireflection coating), a fill factor of 0.68, and a conversion  
 efficiency of 11%. Annealing at 1100.degree. for a few minutes followed  
 by a slow cooling rate was required to obtain optimized performance. For  
 a fixed \*\*\*grating\*\*\* geometry, deep junctions resulted in better  
 cells than shallow junctions within the B implants. The results are  
 described of a numerical simulation in which the alternating direction  
 implicit method was employed to obtain the collection efficiencies of  
 \*\*\*grating\*\*\* cells with the junction depths varied. The computed AM1  
 current-voltage characteristics of \*\*\*grating\*\*\* \*\*\*Si\*\*\* cells  
 are also described.  
 ST \*\*\*silicon\*\*\* solar cell; \*\*\*ion\*\*\* \*\*\*implanted\*\*\*  
 IT \*\*\*grating\*\*\* \*\*\*silicon\*\*\* cell  
 IT Simulation model  
 (for collection efficiency of \*\*\*grating\*\*\* -type \*\*\*silicon\*\*\*  
 solar cells)  
 IT Photoelectric devices  
 (solar, \*\*\*silicon\*\*\*, \*\*\*ion\*\*\* - \*\*\*implanted\*\*\*  
 \*\*\*grating\*\*\* -type, junction depth dependence of)  
 IT 7440-21-3, uses and miscellaneous  
 RL: USES (Uses)  
 (photoelec. solar cells, \*\*\*ion\*\*\* - \*\*\*implanted\*\*\*  
 \*\*\*grating\*\*\* -type, junction depth dependence of)  
 L7 ANSWER 98 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1981:18233 CAPLUS  
 DN 94:18233  
 ED Entered STN: 12 May 1984  
 TI \*\*\*Ion\*\*\* \*\*\*implanted\*\*\* \*\*\*grating\*\*\* type \*\*\*silicon\*\*\*  
 solar cells  
 AU Hwang, Huey-Liang; Tang, Ru-Shyah; Loferski, Joseph J.; Yang, Ying-Chuan  
 CS Dep. Electr. Power Eng., Natl. Tsing Hua Univ., Hsinchu, Taiwan  
 SO Proceedings of the Conference on Solid State Devices (1980), Volume Date  
 1979, 11th., 527-32  
 CODEN: PCSDDB  
 DT Journal  
 LA English  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 AB \*\*\*Si\*\*\* \*\*\*grating\*\*\* -type solar cells were fabricated by  
 \*\*\*ion\*\*\* - \*\*\*implantation\*\*\* techniques. The cells as-fabricated  
 showed max. open-circuit voltage of 0.54 V, and max. short-circuit c.d. of  
 34 mA/cm<sup>2</sup> (without antireflection coating) under an air-mass-1  
 illumination, and max. fill factor of 0.68. The series resistance  
 problems were examd., and metal gridding superimposed on the  
 \*\*\*grating\*\*\* was found essential. The effects of impurity profiles and  
 the annealing conditions were studied. For a fixed value of junction  
 depth, the cell output peaked for doping levels of apprx.10<sup>16</sup> cm<sup>-3</sup>. For  
 a fixed \*\*\*grating\*\*\* geometry, within the limits of the  
 \*\*\*implanted\*\*\* \*\*\*ion\*\*\* concn., the deeper the junction the higher  
 the cell efficiency, which is in contrast to the commonly shallow-junction  
 cells. Slow cooling from thermal annealing is essential in improving the  
 \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* solar-cell efficiencies.  
 ST \*\*\*silicon\*\*\* solar cell \*\*\*grating\*\*\* type; boron doping  
 IT \*\*\*silicon\*\*\* solar cell  
 IT Photoelectric devices  
 (solar, \*\*\*silicon\*\*\*, \*\*\*ion\*\*\* - \*\*\*implanted\*\*\*

\*\*\*grating\*\*\* -type, prepn. and performance of)

IT 7440-42-8P, uses and miscellaneous  
 RL: PREP (Preparation)  
 (photoelec. solar cells from \*\*\*silicon\*\*\* doped by, prepn. and  
 performance of \*\*\*grating\*\*\* -type)

IT 7440-21-3P, uses and miscellaneous  
 RL: PREP (Preparation)  
 (photoelec. solar cells, \*\*\*ion\*\*\* - \*\*\*implanted\*\*\*  
 \*\*\*grating\*\*\* -type, prepn. and performance of)

L7 ANSWER 99 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1980:485077 CAPLUS  
 DN 93:85077  
 ED Entered STN: 12 May 1984  
 TI X-ray lithography by synchrotron radiation of the SOR-RING storage ring  
 AU Aritome, H.; Matsui, S.; Moriwaki, K.; Namba, S.  
 CS Fac. Eng. Sci., Osaka Univ., Toyonaka, 560, Japan  
 SO Journal of Vacuum Science and Technology (1979), 16(6), 1939-41  
 CODEN: JVSTAL; ISSN: 0022-5355  
 DT Journal  
 LA English  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic Processes)  
 Section cross-reference(s): 76

AB X-ray lithog. by synchrotron radiation is a promising technique for a very  
 high resolu. replication of submicron patterns. The main disadvantage of  
 x-ray lithog. by synchrotron radiation is that the exptl. system becomes  
 large and expensive. The results of x-ray lithog. by using the SOR-RING  
 storage ring at an electron energy of 300 MeV are presented. The SOR-RING  
 of the University of Tokyo had a radius of curvature of the electron orbit  
 of 1.1 m and a total orbit length of 17.4 m. The fabrication method of  
 x-ray masks for synchrotron radiation is described. As a pattern  
 supporting material, a parylene film of 1-2 .mu.m thick was used. In this  
 case, the wavelength range between 5-10 nm of synchrotron radiation was  
 effective for exposure of resist. The optimum resolu. of pattern  
 replication was obtained. Pattern replication with large contrast was  
 obtained. Line patterns, which were 100-500 nm wide, and \*\*\*grating\*\*\*  
 patterns were replicated in poly(Me methacrylate) resist with a large  
 aspect ratio. The above patterns were transferred in various materials,  
 such as \*\*\*Si\*\*\* and SiO<sub>2</sub>, by reactive sputter etching. Etching mask  
 patterns were replicated from the pattern of resist itself or fabricated  
 by metal lift-off. Vertical-walled line patterns of 0.5-.mu.m-thick  
 \*\*\*Si\*\*\* were obtained by resist as a mask. \*\*\*Ion\*\*\* -  
 \*\*\*bombardment\*\*\* -enhanced chem. etching is described as a pattern  
 transfer method of submicron size.

ST x ray lithog synchrotron radiation  
 IT Photomasks  
 (for x-ray lithog., fabrication of)  
 IT Semiconductor devices  
 (synchrotron radiation x-ray lithog. in fabrication of, masks for)  
 IT Resists  
 (electron-beam, poly(Me methacrylate), for x-ray mask fabrication)  
 IT Electric circuits  
 (micro-, synchrotron radiation x-ray lithog. in fabrication of, masks  
 for)  
 IT Lithography  
 (x-ray, by synchrotron radiation, masks for)  
 IT 9011-14-7  
 RL: USES (Uses)  
 (electron-beam resist, for x-ray mask prepn.)

IT 7440-47-3, uses and miscellaneous 7440-57-5, uses and miscellaneous  
 RL: DEV (Device component use); USES (Uses)  
 (photomask contg., for x-ray lithog. by synchrotron radiation)

IT 7440-21-3, uses and miscellaneous 25722-33-2  
 RL: USES (Uses)  
 (photomask support, for x-ray lithog. by synchrotron radiation)

L7 ANSWER 100 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1980:173188 CAPLUS  
 DN 92:173188  
 ED Entered STN: 12 May 1984  
 TI Fabrication of a \*\*\*grating\*\*\* pattern with submicrometer dimension in  
 \*\*\*silicon\*\*\* crystal by \*\*\*ion\*\*\* - \*\*\*bombardment\*\*\* -enhanced

etching

AU Moriawaki, Kazuyuki; Masuda, Noboru; Aritome, Hiroaki; Namba, Susumu

CS Fac. Eng. Sci., Osaka Univ., Osaka, 560, Japan

SO Japanese Journal of Applied Physics (1980), 19(3), 491-4

CODEN: JJAPA5; ISSN: 0021-4922

DT Journal

LA English

CC 76-4 (Electric Phenomena)

AB \*\*\*Ion\*\*\* - \*\*\*bombardment\*\*\* -enhanced etching (IBEE) as a means for fabrication of submicron pattern is described. Electron beam lithog. and lift-off technique are used to form a Cr mask pattern for \*\*\*ion\*\*\* - \*\*\*bombardment\*\*\*. The etched depth can be controlled from 83 to 128 nm by varying the ion dose with an accuracy of 10 nm. A \*\*\*grating\*\*\* pattern with a period of 0.6 .mu. is fabricated in a \*\*\*Si\*\*\* substrate by IBEE technique by using Ar+ ion. At an Ar+ ion energy of 60 keV, the amt. of side etching is obsd. to be 40 nm for a 0.21-.mu. deep etched sample. This result shows the high resolu. of IBEE.

ST ion etching \*\*\*silicon\*\*\* \*\*\*grating\*\*\*

IT Ion beams

(etching by, \*\*\*silicon\*\*\* crystal rating fabrication by)

IT Etching

(ion-beam, of \*\*\*silicon\*\*\* crystal grading pattern)

IT 7440-21-3, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(etching of grade pattern on crystal of, ion-beam)

IT 14791-69-6, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(etching of \*\*\*silicon\*\*\* crystal grading pattern by beam of)

L7 ANSWER 101 OF 187 CAPLUS COPYRIGHT 2006 ACS on STN

AN 1974:455664 CAPLUS

DN 81:55664

ED Entered STN: 12 May 1984

TI Field effect transistors for Schottky barrier \*\*\*gratings\*\*\* made by electric shielding and \*\*\*ion\*\*\* \*\*\*implantation\*\*\*

AU Arnodo, C.; Martin, P.

CS Lab. Cent. Rech., Thomson-CSF, Orsay, Fr.

SO AVISEM 71, Colloq. Int. Appl. Tech. Vide Ind. Semicond. Composants Electron. Microelectron., [C. R.], 3rd (1971), Meeting Date 1971, 199-204

Publisher: Soc. Fr. Ing. Tech. Vide, Paris, Fr.

CODEN: 28LNAC

DT Conference

LA French

CC 71-13 (Electric Phenomena)

AB A field-effect transistor (channel thickness, length, and width of 0.4, 4, and 25 .mu.m, resp.; gate width of 2 .mu.m), having a p-type \*\*\*Si\*\*\* substrate base and a Schottky-barrier gate, was prepd. by: (1) making an opening in the SiO2 layer (thickness 1 .mu.m) for the contacts (source, drain, and channel); (2) reforming a 1000-.ANG.-thick SiO2 layer; (3) prepg. a Au mask exposing only the zones for the source and drain contacts; (4) implantation of the source and drain contacts (50-keV P ions, dose 1016 ions/cm2); (5) chem. etching of the Au mask; (6) implantation of the channel (100-keV P ions, dose 3 .times. 1016 ions/cm3); (7) annealing at 800.degree. under vacuum for 1 hr; (8) making openings in the 1000-.ANG.SiO2 layer for the source and drain contacts and the gate; (9) prepn. of an inverse mask for the contacts and the gate; (10) deposition of a double layer of Mo and Au by cathodic sputtering; (11) dissoln. of the inverse electroresist mask [poly(methyl methacrylate)]; and (12) annealing the contacts. The elec. characteristics of the transistor were: satn. current 1 mA, pinch-off voltage 1.5 V, blocking voltage -2 V, and transconductance 0.6 mmho.

ST \*\*\*silicon\*\*\* Schottky barrier transistor; field effect

\*\*\*silicon\*\*\* transistor

IT Transistors

(field-effect, fabrication of, by electronic masking with phosphorus

\*\*\*ion\*\*\* \*\*\*implantation\*\*\* )

IT 7723-14-0, uses and miscellaneous

RL: USES (Uses)

( \*\*\*silicon\*\*\* field-effect transistor fabrication by electronic masking with \*\*\*ion\*\*\* \*\*\*implantation\*\*\* of)

L7 ANSWER 102 OF 187 INSPEC (C) 2006 IEE on STN

AN 2006:8700813 INSPEC  
 TI Submicrometer period \*\*\*silicon\*\*\* diffraction \*\*\*gratings\*\*\* by  
 porous etching.  
 AU Nagy, N.; Volk, J.; Hamori, R.; Barsony, I. (Res. Inst. for Tech. Phys. &  
 Mater. Sci., Budapest, Hungary)  
 SO Physica Status Solidi A (June 2005) vol.202, no.8, p.1639-43. 10 refs.  
 Published by: Wiley-VCH  
 CODEN: PSSABA ISSN: 0031-8965  
 SICI: 0031-8965(200506)202:8L.1639:SPSD;1-D  
 Conference: 4th International Conference on Porous Semiconductors-Science  
 and Technology (PSST-2004). Valencia, Spain, 14-19 March 2004  
 DT Conference Article; Journal  
 TC Experimental  
 CY Germany, Federal Republic of  
 LA English  
 AB We have developed a new technique to manufacture diffraction  
 \*\*\*gratings\*\*\* on porous \*\*\*silicon\*\*\* and on \*\*\*silicon\*\*\*  
 interface. Using holography facilitate to adjust the periodic length of  
 \*\*\*gratings\*\*\* in the submicron range. The holographically exposed and  
 developed photoresist applied on the \*\*\*silicon\*\*\* surface provides  
 the mask for the \*\*\*ion\*\*\* \*\*\*implantation\*\*\*. The sinusoidal  
 \*\*\*grating\*\*\* between the substrate and the porous \*\*\*silicon\*\*\*  
 layer is achieved after the anodic etch process. The PS layer can be  
 removed by alkali etching. Sinusoidal one- and two-dimensional diffraction  
 \*\*\*gratings\*\*\* have been produced with 375 nm periodic length. Their AFM  
 images are shown. The diffraction efficiencies were measured.  
 CC A4240E Holographic optical elements; holographic gratings; A4280F  
 Gratings, echelles; A4280L Optical waveguides and couplers; A8160C Surface  
 treatment and degradation in semiconductor technology  
 CT ATOMIC FORCE MICROSCOPY; DIFFRACTION \*\*\*GRATINGS\*\*\*; ELEMENTAL  
 SEMICONDUCTORS; ETCHING; HOLOGRAPHIC \*\*\*GRATINGS\*\*\*; \*\*\*ION\*\*\*  
 \*\*\*IMPLANTATION\*\*\*; MASKS; OPTICAL FABRICATION; OPTICAL WAVEGUIDES;  
 PHOTORESISTS; POROUS SEMICONDUCTORS; \*\*\*SILICON\*\*\*  
 ST \*\*\*submicrometer period silicon diffraction grating\*\*\*; porous  
 etching; diffraction efficiency; \*\*\*porous silicon\*\*\*; \*\*\*silicon\*\*\*  
 \*\*\*interface\*\*\*; holography; photoresist; mask; \*\*\*ion implantation\*\*\*;  
 \*\*\*sinusoidal grating\*\*\*; anodic etch process; alkali etching; AFM;  
 \*\*\*Si\*\*\*  
 CHI Si sur, Si el  
 ET Si  
 L7 ANSWER 103 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 2005:8675507 INSPEC  
 TI High speed 2\*2 optical switch in \*\*\*silicon\*\*\* -on-insulator based on  
 plasma dispersion effect.  
 AU Sun Fei; Yu Jin-Zhong; Chen Shao-Wu (Nat. Key Lab. on Integrated  
 Optoelectronics, Chinese Acad. of Sci., China)  
 SO Chinese Physics Letters (Dec. 2005) vol.22, no.12, p.3097-9. 16 refs.  
 Published by: Chinese Phys. Soc  
 Price: CCCC 0256-307X/05/123097+03\$30.00  
 CODEN: CPLLEU ISSN: 0256-307X  
 SICI: 0256-307X(200512)22:12L.3097:HSOS;1-N  
 DT Journal  
 TC Practical; Experimental  
 CY China  
 LA English  
 AB Based on free carrier plasma dispersion effect, a 2\*2 optical switch is  
 fabricated in a \*\*\*silicon\*\*\* -on-insulator substrate by inductively  
 coupled-plasma technology and \*\*\*ion\*\*\* \*\*\*implantation\*\*\*. The  
 device has a Mach-Zehnder interferometer structure, in which two  
 directional \*\*\*couplers\*\*\* serve as the power splitter and combiner.  
 The switch presents an insertion loss of 3.04 dB and a response time of  
 496 ns.  
 CT ELEMENTAL SEMICONDUCTORS; HIGH-SPEED OPTICAL TECHNIQUES; MACH-ZEHNDER  
 INTERFEROMETERS; OPTICAL BEAM SPLITTERS; OPTICAL DIRECTIONAL  
 \*\*\*COUPLERS\*\*\*; OPTICAL FABRICATION; OPTICAL LOSSES; OPTICAL SWITCHES;  
 \*\*\*SILICON\*\*\* -ON-INSULATOR  
 ST high speed 2\*2 optical switch; optical communications;  
 \*\*\*silicon-on-insulator\*\*\*; free carrier plasma dispersion effect;  
 Mach-Zehnder interferometer structure; power splitter; power combiner;  
 insertion loss; response time; 3.04 dB; 496 ns; \*\*\*Si\*\*\*  
 CHI Si int, Si el

PHP loss 3.04E+00 dB; time 4.96E-07 s  
ET B; Si

L7 ANSWER 104 OF 187 INSPEC (C) 2006 IEE on STN  
AN 2005:8565691 INSPEC DN A2005-21-4280L-002; B2005-10-4130-060  
TI Subterranean \*\*\*silicon\*\*\* photonics: demonstration of buried  
waveguide-coupled microresonators.  
AU Indukuri, T.; Koonath, P.; Jalali, B. (Dept. of Electr. Eng., Univ. of  
California, Los Angeles, CA, USA)  
SO Applied Physics Letters (22 Aug. 2005) vol.87, no.8, p.81114-1-3. 11 refs.  
Doc. No.: S0003-6951(05)06232-7  
Published by: AIP  
Price: CCCC 0003-6951/2005/87(8)/081114-1(3)/\$22.00  
CODEN: APPLAB ISSN: 0003-6951  
SICI: 0003-6951(20050822)87:8L.81114:SSPD;1-F

DT Journal  
CY United States  
LA English

AB Laterally-coupled \*\*\*silicon\*\*\* microresonators are fabricated beneath  
the surface of a \*\*\*silicon\*\*\* -on-insulator substrate using a modified  
separation by implantation of an oxygen technique. \*\*\*Implantation\*\*\*  
of oxygen \*\*\*ions\*\*\* into a substrate with patterned thermal oxide  
mask was utilized to realize buried waveguiding structures. Microdisk  
resonators in the buried \*\*\*silicon\*\*\* layer show loaded quality  
factors of 2000, with extinction ratios in excess of 20 dB. The process  
also results in the formation of a \*\*\*silicon\*\*\* layer on the surface  
of the wafer that is suitable for the fabrication of electronic devices,  
thereby paving the way for three-dimensional monolithic integration of  
electronics and photonics in \*\*\*silicon\*\*\*.

CC A4280L Optical waveguides and couplers; A4285D Optical fabrication,  
surface grinding; A6170T Doping and implantation of impurities; B4130  
Optical waveguides; B2550G Lithography (semiconductor technology); B2550B  
Semiconductor doping; B4270 Integrated optoelectronics

CT ELEMENTAL SEMICONDUCTORS; INTEGRATED OPTOELECTRONICS; \*\*\*ION\*\*\*  
\*\*\*IMPLANTATION\*\*\*; MASKS; MICROCAVITIES; OPTICAL \*\*\*COUPLERS\*\*\*;  
OPTICAL FABRICATION; OPTICAL RESONATORS; OPTICAL WAVEGUIDES; OXYGEN;  
SEPARATION; \*\*\*SILICON\*\*\*

ST \*\*\*subterranean silicon photonics\*\*\*; buried waveguide-coupled  
microresonators; \*\*\*silicon-on-insulator substrate\*\*\*; modified  
separation; oxygen implantation; patterned thermal oxide mask; microdisk  
resonators; quality factors; extinction ratios; three-dimensional  
monolithic integration

ET B

L7 ANSWER 105 OF 187 INSPEC (C) 2006 IEE on STN  
AN 2005:8502529 INSPEC DN A2005-17-4283-001; B2005-09-4145-001  
TI Microring and microdisk optical resonators using \*\*\*silicon\*\*\*  
nanocrystals and erbium prepared using \*\*\*silicon\*\*\* technology.  
AU Gardner, D.S. (Microprocessor Technol. Labs., Intel Corp., Santa Clara,  
CA, USA); Brongersma, M.L.  
SO Optical Materials (Feb. 2005) vol.27, no.5, p.804-11. 28 refs.  
Doc. No.: S0925-3467(04)00214-9  
Published by: Elsevier  
CODEN: OMATET ISSN: 0925-3467  
SICI: 0925-3467(200502)27:5L.804:MMOR;1-D

DT Journal  
TC Experimental  
CY Netherlands  
LA English

AB A methodology for the integration of narrow-linewidth light sources  
monolithically onto \*\*\*silicon\*\*\* using \*\*\*silicon\*\*\* process  
technology is presented. Microcavity resonator based narrow-linewidth  
light sources were designed and modeled using the 3-D full-wave  
finite-difference time-domain (FDTD) method of solving Maxwell's  
equations. The microcavity confines light to a small modal volume by  
resonant recirculation in a structure with low roundtrip optical loss. The  
resonators were formed in close proximity to waveguides used for  
evanescent-wave coupling of light out of the microcavity. Waveguides using  
\*\*\*Si\*\*\* -nanocrystals in SiO<sub>2</sub> are difficult to couple to planar  
microdisks because the mode extends deep into the oxide, whereas  
simulations show that microresonators using SiN<sub>x</sub> can. The coupling  
efficiency between the resonator and the single-mode waveguides was

optimized by varying the gap size and the waveguide width and thickness. Luminescence from \*\*\*silicon\*\*\* nanoparticles in both SiO<sub>2</sub> and SiN<sub>x</sub> films was studied. Process optimization for forming \*\*\*Si\*\*\* nanoparticles in SiO<sub>2</sub> or SiN<sub>x</sub> including the effects of hydrogen annealing and the preparation of SiN<sub>x</sub> films with excess \*\*\*Si\*\*\* by various techniques (CVD and \*\*\*Si\*\*\* \*\*\*ion\*\*\* \*\*\*implantation\*\*\* ) was performed. High-index-contrast microcavity resonators were fabricated using SiN<sub>x</sub> on SiO<sub>2</sub> with \*\*\*silicon\*\*\* nanoparticles and imaged using atomic force microscopy. The structures include microdisk and microring cavities doped with \*\*\*silicon\*\*\* nanoparticles with and without erbium. [All rights reserved Elsevier].

CC A4283 Micro-optical devices and technology; A4282 Integrated optics; A6170A Annealing processes; A8115H Chemical vapour deposition; A7855C Photoluminescence in elemental semiconductors; A4280L Optical waveguides and couplers; A4215E Optical system design; A4285D Optical fabrication, surface grinding; B4145 Micro-optical devices and technology; B4140 Integrated optics; B2550A Annealing processes in semiconductor technology; B0520F Chemical vapour deposition; B4220 Luminescent materials; B4130 Optical waveguides

CT ANNEALING; ATOMIC FORCE MICROSCOPY; CHEMICAL VAPOUR DEPOSITION; ELEMENTAL SEMICONDUCTORS; ERBIUM; FINITE DIFFERENCE TIME-DOMAIN ANALYSIS; INTEGRATED OPTICS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; LIGHT SOURCES; LUMINESCENCE; MAXWELL EQUATIONS; MICRO-OPTICS; MICROCAVITIES; NANOPARTICLES; OPTICAL \*\*\*COUPLERS\*\*\* ; OPTICAL DESIGN TECHNIQUES; OPTICAL FABRICATION; OPTICAL LOSSES; OPTICAL RESONATORS; OPTICAL WAVEGUIDES; \*\*\*SILICON\*\*\*

ST microring optical resonators; microdisk optical resonators; \*\*\*silicon\*\*\* \*\*\* nanocrystals\*\*\* ; erbium; \*\*\*silicon technology\*\*\* ; narrow-linewidth light sources; microcavity resonator; 3-D full-wave finite-difference time-domain method; FDTD method; Maxwell equations; resonant recirculation; roundtrip optical loss; evanescent-wave coupling; coupling efficiency; single-mode waveguides; luminescence; \*\*\*silicon\*\*\*

\*\*\* nanocrystals\*\*\* ; process optimization; hydrogen annealing; CVD; \*\*\*ion implantation\*\*\* ; atomic force microscopy; \*\*\*Si\*\*\* ; Er; SiO<sub>2</sub>; SiN<sub>x</sub>

CHI Si el; Er el; SiO<sub>2</sub> bin, O<sub>2</sub> bin, Si bin, O bin; SiN bin, Si bin, N bin

ET D; Si; O\*Si; SiO<sub>2</sub>; Si cp; cp; O cp; N\*Si; SiN<sub>x</sub>; N cp; Er; SiO; O; SiN

L7 ANSWER 106 OF 187 INSPEC (C) 2006 IEE on STN

AN 2005:8502518 INSPEC DN A2005-17-7865H-002; B2005-09-2530C-014

TI Optical gain in different \*\*\*silicon\*\*\* nanocrystal systems.

AU Fauchet, P.M.; Ruan, J.; Chen, H. (Dept. of Electr. & Comput. Eng., Univ. of Rochester, NY, USA); Pavesi, L.; Negro, L.D.; Cazzanelli, M.; Elliman, R.G.; Smith, N.; Samoc, M.; Luther-Davies, B.

SO Optical Materials (Feb. 2005) vol.27, no.5, p.745-9. 22 refs. Doc. No.: S0925-3467(04)00221-6 Published by: Elsevier CODEN: OMATET ISSN: 0925-3467 SICI: 0925-3467(200502)27:5L:745:OGDS;1-4

DT Journal

TC Experimental

CY Netherlands

LA English

AB An extensive experimental study of optical gain in \*\*\*silicon\*\*\* nanocrystals is under way. Different types of samples have been tested (e.g., nanocrystalline \*\*\*silicon\*\*\* superlattices prepared in Rochester, \*\*\*ion\*\*\* \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* dioxide prepared in Canberra) using different measurement techniques (e.g., variable stripe length method in Trento and in Rochester, prism coupling in Canberra) and different pump laser sources (from femtosecond to cw). All the results presented here have been reproduced in at least two different laboratories, making it unlikely that experimental artifacts play a role. So far, we have observed nsec-duration gain in the visible/near infrared range in nanocrystalline \*\*\*silicon\*\*\* superlattices under high photoinjection conditions with short laser pulses. For other conditions (e.g., lower photoinjection, \*\*\*ion\*\*\* \*\*\*implanted\*\*\* samples with a lower concentration of quantum dots), we have not observed gain. [All rights reserved Elsevier].

CC A7865H Optical properties of elemental semiconductors (thin films/low-dimensional structures); A4280W Ultrafast optical techniques; A4280L Optical waveguides and couplers; A4270Y Other optical materials; A4280G Optical prisms and projection systems; B2530C Semiconductor superlattices, quantum wells and related structures; B2520C Elemental



semiconductors; B4110 Optical materials

CT ELEMENTAL SEMICONDUCTORS; HIGH-SPEED OPTICAL TECHNIQUES; \*\*\*ION\*\*\*  
 \*\*\*IMPLANTATION\*\*\* ; NANOSTRUCTURED MATERIALS; OPTICAL \*\*\*COUPLERS\*\*\*  
 ; OPTICAL MATERIALS; OPTICAL PRISMS; OPTICAL PUMPING; SEMICONDUCTOR  
 SUPERLATTICES; \*\*\*SILICON\*\*\* ; \*\*\*SILICON\*\*\* COMPOUNDS

ST \*\*\*silicon nanocrystal systems\*\*\* ; optical gain; \*\*\*nanocrystalline\*\*\*  
 \*\*\* silicon superlattices\*\*\* ; \*\*\*ion implanted silicon dioxide\*\*\* ;  
 variable stripe length method; prism coupling; pump laser sources;  
 photoinjection; quantum dots; \*\*\*Si\*\*\* ; SiO<sub>2</sub>

CHI Si el; SiO<sub>2</sub> bin, O<sub>2</sub> bin, Si bin, O bin

ET Si; O\*Si; SiO<sub>2</sub>; Si cp; cp; O cp; SiO; O

L7 ANSWER 107 OF 187 INSPEC (C) 2006 IEE on STN

AN 2005:8484531 INSPEC DN A2005-16-4280L-020; B2005-08-4130-042

TI Refractive index profiles of planar optical waveguides in beta 2-BBO  
 produced by \*\*\*silicon\*\*\* \*\*\*ion\*\*\* \*\*\*implantation\*\*\* .

AU Xue-Lin Wang; Feng Chen; Fei Lu; Gang Fu; Shi-Ling Li; Ke-Ming Wang (Dept.  
 of Phys., Shandong Univ., China); Qing-Ming Lu; Ding-Yu Shen; Hong-Ji Ma;  
 Rui Nie

SO Optical Materials (Dec. 2004) vol.27, no.3, p.459-63. 11 refs.  
 Doc. No.: S0925-3467(04)00325-8  
 Published by: Elsevier  
 CODEN: OMATET ISSN: 0925-3467  
 SICI: 0925-3467(200412)27:3L:459:RIPP;1-Y

DT Journal

TC Theoretical; Experimental

CY Netherlands

LA English

AB The planar waveguides have been fabricated inz-cut beta barium metaborate  
 crystals by 2.8MeV \*\*\*Si\*\*\* + \*\*\*ion\*\*\* \*\*\*implantation\*\*\* with  
 doses of 1\*10<sup>15</sup> and 3\*10<sup>15</sup> ions/cm<sup>2</sup> at room temperature. The waveguides  
 were characterized by the prism-coupling method. The refractive index  
 profiles were reconstructed using reflectivity calculation method. It is  
 found that relatively large positive changes of extraordinary refractive  
 indices happen in the guiding regions, and the negative changes of  
 ordinary refractive indices happen at the end of the track. TRIM'98  
 (transport of ions in matter) code was used to simulate the damage profile  
 in beta -BBO by 2.8MeV \*\*\*Si\*\*\* + \*\*\*ion\*\*\* \*\*\*implantation\*\*\* .  
 [All rights reserved Elsevier].

CC A4280L Optical waveguides and couplers; A4282 Integrated optics; A6180J  
 Ion beam effects; A4285D Optical fabrication, surface grinding; A4270Y  
 Other optical materials; A4280G Optical prisms and projection systems;  
 A7820D Optical constants and parameters (condensed matter); B4130 Optical  
 waveguides; B4140 Integrated optics; B4110 Optical materials

CT BARIUM COMPOUNDS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; OPTICAL  
 \*\*\*COUPLERS\*\*\* ; OPTICAL FABRICATION; OPTICAL MATERIALS; OPTICAL PLANAR  
 WAVEGUIDES; OPTICAL PRISMS; REFLECTIVITY; REFRACTIVE INDEX;  
 \*\*\*SILICON\*\*\*

ST refractive index; planar optical waveguides; \*\*\*silicon ion\*\*\*  
 \*\*\* implantation\*\*\* ; z-cut beta barium metaborate crystals; prism-coupling  
 method; reflectivity calculation method; TRIM'98 code; 2.8 MeV; 20 degC;  
 BBO; \*\*\*Si\*\*\* ; BaB<sub>2</sub>O<sub>4</sub>

CHI BaB<sub>2</sub>O<sub>4</sub> ss, B<sub>2</sub> ss, Ba ss, O<sub>4</sub> ss, B ss, O ss; Si el

PHP electron volt energy 2.8E+06 eV; temperature 2.93E+02 K

ET Si; Si+; Si ip 1; ip 1; B\*Ba\*O; BaB<sub>2</sub>O; Ba cp; cp; B cp; O cp; B; Ba; O

L7 ANSWER 108 OF 187 INSPEC (C) 2006 IEE on STN

AN 2004:8195221 INSPEC DN A2005-01-6855-053; B2005-01-0520J-019

TI Structure and optical properties of sol-gel derived Gd<sub>2</sub>O<sub>3</sub> waveguide films.

AU Hai Guo (Struct. Res. Lab., Univ. of Sci. & Technol. of China, Hefei,  
 China); Xudong Yang; Teng Xiao; Weiping Zhang; Liren Lou; Jacques Mugnier

SO Applied Surface Science (31 May 2004) vol.230, no.1-4, p.215-21. 22 refs.  
 Published by: Elsevier  
 Price: CCCC 0169-4332/04/\$30.00  
 CODEN: ASUSEE ISSN: 0169-4332  
 SICI: 0169-4332(20040531)230:1/4L:215:SOPD;1-I

DT Journal

TC Experimental

CY Netherlands

LA English

AB Pure and rare earth doped gadolinium oxide (Gd<sub>2</sub>O<sub>3</sub>) waveguide films were  
 prepared by a simple sol-gel process and dip-coating method. Gd<sub>2</sub>O<sub>3</sub> was

successfully synthesized by hydrolysis of gadolinium acetate. Thermogravimetric analysis (TGA) and differential thermal analysis (DTA) were used to study the thermal chemistry properties of dried gel. Structure of Gd<sub>2</sub>O<sub>3</sub> films annealed at different temperature ranging from 400 to 750 degrees C were investigated by Fourier transform infrared (FT-IR) spectroscopy, X-ray diffraction (XRD) and transmission electron microscopy (TEM). The results show that Gd<sub>2</sub>O<sub>3</sub> starts crystallizing at about 400 degrees C and the crystallite size increases with annealing temperature. Oriented growth of (400) face of Gd<sub>2</sub>O<sub>3</sub> has been observed when the films were deposited on (100) \*\*\*Si\*\*\* substrate and annealed at 750 degrees C. The laser beam (  $\lambda = 632.8$  nm) was coupled into the film by a prism \*\*\*coupler\*\*\* and propagation loss of the film measured by scattering-detection method is about 2 dB/cm. Luminescence properties of europium \*\*\*ions\*\*\* \*\*\*doped\*\*\* films were measured and are discussed.

- CC A6855 Thin film growth, structure, and epitaxy; A8115L Deposition from liquid phases (melts and solutions); A4280L Optical waveguides and couplers; A6180B Ultraviolet, visible and infrared radiation effects; A6480G Microstructure; A7855H Photoluminescence in other inorganic materials; A6470K Solid-solid transitions; A7865P Optical properties of other inorganic semiconductors and insulators (thin films/low-dimensional structures); A7830G Infrared and Raman spectra in inorganic crystals; A8140G Other heat and thermomechanical treatments; B0520J Deposition from liquid phases; B4130 Optical waveguides
- CT ANNEALING; CRYSTALLISATION; CRYSTALLITES; DIFFERENTIAL THERMAL ANALYSIS; DIP COATING; EUROPIUM; FOURIER TRANSFORM SPECTRA; GADOLINIUM COMPOUNDS; INFRARED SPECTRA; LUMINESCENCE; OPTICAL WAVEGUIDES; SOL-GEL PROCESSING; TRANSMISSION ELECTRON MICROSCOPY; WAVE PROPAGATION; X-RAY DIFFRACTION
- ST structural properties; optical properties; Gd<sub>2</sub>O<sub>3</sub> waveguide films; sol-gel process; dip coating method; hydrolysis; gadolinium acetate; thermogravimetric analysis; TGA; differential thermal analysis; DTA; thermal chemistry; annealing; infrared spectra; X-ray diffraction; XRD; transmission electron microscopy; TEM; laser beam; \*\*\*prism coupler\*\*\*; propagation loss; scattering-detection method; luminescence properties; europium ions; crystallization; Fourier transform spectra; \*\*\* (100) Si \*\*\*
- \*\*\* substrate \*\*\* ; 400 to 750 degC; 632.8 nm; \*\*\*Si\*\*\* ; Gd<sub>2</sub>O<sub>3</sub>:Eu
- CHI Si sur, Si el; Gd<sub>2</sub>O<sub>3</sub>:Eu ss, Gd<sub>2</sub> ss, Eu ss, Gd ss, O<sub>3</sub> ss, O ss, Gd<sub>2</sub>O<sub>3</sub> bin, Gd<sub>2</sub> bin, Gd bin, O<sub>3</sub> bin, O bin, Eu el, Eu dop
- PHP temperature 6.73E+02 to 1.02E+03 K; wavelength 6.328E-07 m
- ET Gd\*O; Gd<sub>2</sub>O<sub>3</sub>; Gd cp; cp; O cp; C; Si; B; Eu\*Gd\*O; Eu sy 3; Gd sy 3; O sy 3; Gd<sub>2</sub>O<sub>3</sub>:Eu; Eu doping; doped materials; Gd<sub>2</sub>O; Eu; Gd; O
- L7 ANSWER 109 OF 187 INSPEC (C) 2006 IEE on STN
- AN 2004:8194053 INSPEC DN A2005-01-4285D-005
- TI Spontaneously generated sinusoidallike structures on Ti-Ni thin film under focused \*\*\*ion\*\*\* -beam \*\*\*bombardment\*\*\* .
- AU Yongqi Fu (Innovation in Manuf. Syst. & Technol., Massachusetts Inst. of Technol. Alliance, Nanyang, Singapore); Bryan, N.K.A.
- SO Optics Express (9 Aug. 2004) vol.12, no.16. 10 refs.  
Collection URL: <http://www.opticsexpress.org/>  
Published by: Opt. Soc. America  
Price: CCCC 1094-4087/04/\$15.00  
CODEN: OPEXFF ISSN: 1094-4087
- DT Journal
- TC Experimental
- CY United States
- LA English
- AB A new fabrication method for a sinusoidallike structure is described. The sinusoidal structure can be spontaneously self-formed on the surface of a substrate by focused \*\*\*ion\*\*\* -beam \*\*\*bombardment\*\*\* with raster scanning and an \*\*\*ion\*\*\* incident angle perpendicular to the sample surface (normal incidence). The substrate material is a \*\*\*silicon\*\*\* wafer coated with 2-  $\mu$ m-thick Ti-Ni thin film. We show by measurement and analysis of the \*\*\*grating\*\*\* characteristics at the working wavelength range from 50 to 1500 nm that the technique of self-organized formation is a valid approach for microfabrication of diffractive structures, and the spontaneously generated structure under \*\*\*ion\*\*\* \*\*\*bombardment\*\*\* is applicable for a sinusoidal \*\*\*grating\*\*\* that functions from the ultraviolet to the near-infrared wavelength range.
- CC A4285D Optical fabrication, surface grinding; A4280F Gratings, echelles; A7865E Optical properties of metals and metallic alloys (thin films/low-dimensional structures)

CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; FOCUSED ION BEAM TECHNOLOGY; METALLIC THIN  
FILMS; NICKEL; OPTICAL FABRICATION; SELF-ASSEMBLY; TITANIUM  
ST sinusoidallike structures; Ti-Ni thin film; \*\*\*focused ion-beam\*\*\*  
\*\*\* bombardment\*\*\* ; raster scanning; \*\*\*silicon wafer\*\*\* ; \*\*\*grating\*\*\*  
\*\*\* characteristics\*\*\* ; self-organized formation; microfabrication; 2 mum;  
50 to 1500 nm; Ti-Ni; \*\*\*Si\*\*\*  
CHI TiNi sur, Ni sur, Ti sur, TiNi ss, Ni ss, Ti ss; Si sur, Si el  
PHP size 2.0E-06 m; wavelength 5.0E-08 to 1.5E-06 m  
ET Ni\*Ti; Ni sy 2; sy 2; Ti sy 2; Ti-Ni; Si; TiNi; Ti cp; cp; Ni cp; Ni; Ti

L7 ANSWER 110 OF 187 INSPEC (C) 2006 IEE on STN  
AN 2004:8138578 INSPEC DN A2004-23-8160C-011; B2004-11-2550E-054  
TI Fabrication and thermal annealing behavior of nanoscale ripple fabricated  
by focused ion beam.  
AU Xie, D.Z.; Ngoi, B.K.A.; Zhou, W.; Fu, Y.Q. (Sch. of Mech. & Production  
Eng., Nanyang Technol. Univ., Singapore)  
SO Applied Surface Science (15 April 2004) vol.227, no.1-4, p.250-4. 21 refs.  
Published by: Elsevier  
Price: CCCC 0169-4332/04/\$30.00  
CODEN: ASUSEE ISSN: 0169-4332  
SICI: 0169-4332(20040415)227:1/4L.250:FTAB;1-Z  
DT Journal  
TC Practical; Experimental  
CY Netherlands  
LA English  
AB The development, during annealing, of periodic one-dimensional ripple  
structure has been investigated. The nanoscale ripple array was fabricated  
on \*\*\*silicon\*\*\* (001) crystal surface using focused ion beam (FIB).  
Annealing was performed isothermally in a flowing argon gas ambient at 670  
degrees C. The morphology of the ripple before and after annealing was  
analyzed by use of atomic force microscope. The height of the ripple  
decreased after thermal annealing. Furthermore, after annealing, spikes of  
gallium and/or gallium-rich precipitate were also observed on the surface  
of the ripples and the FIB milled areas.

CC A8160C Surface treatment and degradation in semiconductor technology;  
A4280F Gratings, echelles; A6820 Solid surface structure; A6170A Annealing  
processes; A6822 Surface diffusion, segregation and interfacial compound  
formation; A6170T Doping and implantation of impurities; B2550E Surface  
treatment (semiconductor technology); B2550N Nanometre-scale semiconductor  
fabrication technology; B2550A Annealing processes in semiconductor  
technology; B2550B Semiconductor doping  
CT ANNEALING; ATOMIC FORCE MICROSCOPY; DIFFRACTION \*\*\*GRATINGS\*\*\* ;  
FOCUSED ION BEAM TECHNOLOGY; GALLIUM; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\*  
; MICROMACHINING; NANOTECHNOLOGY; SPUTTER ETCHING; SURFACE DIFFUSION;  
SURFACE MORPHOLOGY  
ST nanoscale ripple fabrication; thermal annealing; focused ion beam milling;  
periodic one dimensional ripple structure; nanoscale ripple array;  
\*\*\*silicon(001) crystal surface\*\*\* ; ripple morphology; atomic force  
microscopy; gallium spikes; gallium rich precipitate; 670 degC;  
\*\*\*Si:Ga\*\*\*  
CHI Si:Ga sur, Ga sur, Si sur, Si:Ga bin, Ga bin, Si bin, Ga el, Si el, Ga dop  
PHP temperature 9.43E+02 K  
ET C; Ga\*Si; Ga sy 2; sy 2; Si sy 2; Si:Ga; Ga doping; doped materials; Ga;  
Si

L7 ANSWER 111 OF 187 INSPEC (C) 2006 IEE on STN  
AN 2004:8099325 INSPEC DN A2004-21-4280L-004; B2004-10-4130-059  
TI Unique nonlinear optical and electronic properties of SiC:Ge waveguide for  
device applications.  
AU Darwish, A.M. (Laser-Matter Res. Lab. Inc., Dillard Univ., Normal, AL,  
USA); Koplitz, B.D.; Kukhtarev, N.V.; Mitchell, O.; Haydel, R.; Gomlak,  
G.; Combs, R.  
SO Proceedings of the SPIE - The International Society for Optical  
Engineering (2003) vol.5206, no.1, p.166-76. 17 refs.  
Published by: SPIE-Int. Soc. Opt. Eng  
Price: CCCC 0277-786X/03/\$15.00  
CODEN: PSISDG ISSN: 0277-786X  
SICI: 0277-786X(2003)5206:1L.166:UNOE;1-L  
Conference: Photorefractive Fiber and Crystal Devices: Materials, Optical  
Properties, and Applications IX. San Diego, CA,USA, 3-4 Aug 2003  
DT Conference Article; Journal  
TC Practical; Experimental

CY United States  
 LA English  
 AB Using a combination of \*\*\*ion\*\*\* \*\*\*implantation\*\*\* and laser ablation techniques, a waveguide of \*\*\*ion\*\*\* \*\*\*implanted\*\*\* SiC:Ga:Ge was fabricated and was used as a CO2 laser line selector. It was observed that the CO2 laser produces a thermal \*\*\*grating\*\*\* which drives the optical selector with maximum efficiency of 40 MHz of laser offset between the 9P20 and 9P18 CO2 laser lines. Using an external electric field, the moving thermal \*\*\*grating\*\*\* produces a 45 MHz offset between the laser lines. This phenomenon will be explained using the Kukhtarev model. The threshold of the thermal damage for the waveguide and the device limiting will be presented.

CC A4280L Optical waveguides and couplers; A4262A Laser materials processing; A6180B Ultraviolet, visible and infrared radiation effects; A4255D CO/sub 2/ lasers; A4285D Optical fabrication, surface grinding; B4130 Optical waveguides; B2550B Semiconductor doping; B4360B Laser materials processing; B4320C Gas lasers

CT ELECTRO-OPTICAL EFFECTS; GALLIUM; GAS LASERS; GERMANIUM; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; LASER ABLATION; NONLINEAR OPTICS; OPTICAL FABRICATION; OPTICAL WAVEGUIDES; SEMICONDUCTOR THIN FILMS; \*\*\*SILICON\*\*\* COMPOUNDS; THERMO-OPTICAL EFFECTS

ST nonlinear optical properties; electronic properties; SiC:Ge waveguide; \*\*\*ion implantation\*\*\* ; laser ablation; CO2 laser line selector; \*\*\*thermal grating\*\*\* ; optical selector; laser offset; 9P20 CO2 laser lines; 9P18 CO2 laser lines; electric field; Kukhtarev model; thermal damage; thin film semiconductors; wavelength selector; 40 MHz; SiC-Ga-Ge; CO

CHI SiCGaGe ss, Ga ss, Ge ss, Si ss, C ss; CO bin, C bin, O bin  
 PHP frequency 4.0E+07 Hz  
 ET C\*Ge\*Si; C sy 3; sy 3; Ge sy 3; Si sy 3; SiC:Ge; Ge doping; doped materials; Si cp; cp; C cp; C\*Ga\*Ge\*Si; C sy 4; sy 4; Ga sy 4; Ge sy 4; Si sy 4; SiC:Ga:Ge; Ga:Ge doping; C\*O; CO2; O cp; P; SiC; SiC-Ga-Ge; CO; SiCGaGe; Ga cp; Ge cp; Ga; Ge; Si; O

L7 ANSWER 112 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 2004:8041020 INSPEC DN A2004-18-4285D-002; B2004-09-2550E-009  
 TI Self-organized formation of a blazed- \*\*\*grating\*\*\* -like structure on \*\*\*Si\*\*\* (100) induced by focused ion-beam scanning.

AU Yongqi Fu (Innovation In Manuf. Syst. & Technol., Singapore, Singapore); Bryan, N.K.A.; Wei Zhou

SO Optics Express (26 Jan. 2004) vol.12, no.2. 12 refs.  
 Collection URL: <http://www.opticsexpress.org/>  
 Published by: Opt. Soc. America  
 Price: CCCC 1094-4087/04/\$15.00  
 CODEN: OPEXFF ISSN: 1094-4087

DT Journal  
 TC Experimental  
 CY United States  
 LA English  
 AB A new one-step method, which has been named self-organized formation, for microfabrication of blazed- \*\*\*grating\*\*\* -like structures after \*\*\*bombardment\*\*\* with a focused \*\*\*ion\*\*\* beam (FIB) with an ion energy of 50 keV and a beam current of 0.5 nA is presented. The structure is fabricated by the FIB by raster scanning (not by patterned scanning) upon a substrate of a \*\*\*silicon\*\*\* wafer. \*\*\*Si\*\*\* (100), with total scanning time of 14 min. With this method the parameters are unchanged during the whole process, unlike for the point-by-point direct writing technique, in which the exposure intensity or the electron- or ion-beam dose is changed for each point. The surface roughness of the structure. Ra, is 2.5 nm over an area of 1 mu m \* 1 mu m. To evaluate the performance of this method we carried out a simulation, using the PCGrate program. The simulated diffraction efficiency, of diffraction order -3 working in the reflection mode, can be as much as 79.1% for the violet wavelength of 400 nm. Using a He-Ne laser as the light source produced a measured diffraction efficiency of the order of -2 of 70.4%, which is near the simulated value of 76.9% at a wavelength of 600 nm. The depth and the period of the structure can be controlled by process parameters of the FIB, such as ion energy and ion flux.

CC A4285D Optical fabrication, surface grinding; A4280F Gratings, echelles; A8160C Surface treatment and degradation in semiconductor technology; B2550E Surface treatment (semiconductor technology)

CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; LIGHT DIFFRACTION; OPTICAL FABRICATION;

SELF-ASSEMBLY; \*\*\*SILICON\*\*\* ; SPUTTER ETCHING; SURFACE ROUGHNESS  
ST selforganized formation; \*\*\*blazed-grating-like structure\*\*\* ;  
\*\*\*Si(100)\*\*\* ; focused ion-beam scanning; one-step method;  
microfabrication; raster scanning; \*\*\*silicon wafer substrate\*\*\* ;  
point-by-point direct writing technique; ion-beam dose; electron-beam  
dose; surface roughness; PCGrate program; simulated diffraction  
efficiency; diffraction order; violet wavelength; He-Ne laser; ion energy;  
ion flux; 50 keV; 0.5 nA; 14 min; 79.1 percent; 400 nm; 70.4 percent; 76.9  
percent; 600 nm; \*\*\*Si\*\*\*

CHI Si sur, Si el  
PHP electron volt energy 5.0E+04 eV; current 5.0E-10 A; time 8.4E+02 s;  
efficiency 7.91E+01 percent; wavelength 4.0E-07 m; efficiency 7.04E+01  
percent; efficiency 7.69E+01 percent; wavelength 6.0E-07 m

ET Si; Ra; He\*Ne; He-Ne; B\*F; FlB; F cp; cp; B cp

L7 ANSWER 113 OF 187 INSPEC (C) 2006 IEE on STN  
AN 2003:7766274 INSPEC DN A2003-23-6170T-014; B2003-12-2550B-005  
TI Dose dependence of carrier and heat dynamics at an \*\*\*ion\*\*\* -  
\*\*\*implanted\*\*\* \*\*\*silicon\*\*\* surface measured using lens-free  
heterodyne transient \*\*\*grating\*\*\* method.  
AU Katayama, K.; Yamaguchi, M.; Sawada, T. (Dept. of Adv. Mater. Sci., Univ.  
of Tokyo, Chiba, Japan)  
SO Journal of Applied Physics (15 Oct. 2003) vol.94, no.8, p.4904-7. 22 refs.  
Doc. No.: S0021-8979(03)08919-9  
Published by: AIP  
Price: CCCC 0021-8979/2003/94(8)/4904(4)/\$20.00  
CODEN: JAPIAU ISSN: 0021-8979  
SICI: 0021-8979(20031015)94:8L:4904:DDCH;1-3

DT Journal  
TC Experimental  
CY United States  
LA English

AB The lens-free heterodyne transient \*\*\*grating\*\*\* method was shown to  
reveal the dynamics of photoexcited carriers and heat on the surface  
region of an \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* in the  
dose range of 1011-1015 cm<sup>-2</sup>. In addition to the fact that the detection  
limit of the dose was superior to that for conventional methods, several  
physical properties of the carrier and heat can be obtained by analyzing  
transient responses. Theoretical analysis provided the lifetime of  
carriers and thermal diffusion coefficients in the \*\*\*ion\*\*\* -  
\*\*\*implanted\*\*\* surface region.

CC A6170T Doping and implantation of impurities; A6180J Ion beam effects;  
A7220J Charge carriers: generation, recombination, lifetime, and trapping  
(semiconductors/insulators); A7240 Photoconduction and photovoltaic  
effects; photodielectric effects; A7847 Ultrafast optical measurements in  
condensed matter; A6630H Self-diffusion and ionic conduction in solid  
nonmetals; A7280C Electrical conductivity of elemental semiconductors;  
B2550B Semiconductor doping; B2520C Elemental semiconductors

CT CARRIER LIFETIME; ELEMENTAL SEMICONDUCTORS; HIGH-SPEED OPTICAL TECHNIQUES;  
\*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; PHOTOCONDUCTIVITY; SEMICONDUCTOR  
DOPING; \*\*\*SILICON\*\*\* ; THERMAL DIFFUSION

ST \*\*\*ion-implanted silicon surface\*\*\* ; carrier dynamics; heat dynamics;  
\*\*\*lens-free heterodyne transient grating method\*\*\* ; dose dependence;  
photoexcited carriers; carrier lifetime; thermal diffusion coefficients

CHI Si bin, Si el  
ET Si

L7 ANSWER 114 OF 187 INSPEC (C) 2006 IEE on STN  
AN 2003:7560810 INSPEC DN A2003-08-7847-009  
TI Transient reflecting \*\*\*grating\*\*\* spectroscopy for defect analysis in  
surface region of semiconductors.  
AU Katayama, K.; Donen, H.; Sawada, T. (Dept. of Adv. Mater. Sci., Univ. of  
Tokyo, Japan)  
SO Review of Scientific Instruments (Jan. 2003) vol.74, no.1, p.901-3. 19  
refs.  
Doc. No.: S0034-6748(03)08601-5  
Published by: AIP  
Price: CCCC 0034-6748/2003/74(1)/901(3)/\$19.00  
CODEN: RSINAK ISSN: 0034-6748  
SICI: 0034-6748(200301)74:1L:901:TRGS;1-2

DT Journal  
TC Experimental

CY United States  
 LA English  
 AB Ultrafast transient reflecting \*\*\*grating\*\*\* (TRG) spectroscopy was utilized for defect analysis in the surface region of \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* for the \*\*\*implantation\*\*\* range from 1011 to 1015 cm<sup>-2</sup>. To deduce signals due to trapped carriers at defect states, the TRG spectra at the delay time of 30 ps were measured because ultrafast carrier dynamics such as many-body recombination had finished before the delay time. According to the dose quantity, the peak of the interband transition was affected and also defect-related transitions emerged. Using this technique, implantation damage can be detected for samples with their dose larger than 1012 cm<sup>-2</sup>. It was proposed that TRG spectroscopy can be used as a novel analytical method for characterizing defects in the surface region of semiconductors.

CC A7847 Ultrafast optical measurements in condensed matter; A7840E Visible and ultraviolet spectra of elemental semiconductors; A6170T Doping and implantation of impurities; A6180J Ion beam effects; A7155E Impurity and defect levels in elemental semiconductors; A7325 Surface conductivity and carrier phenomena; A7320H Surface impurity and defect levels; energy levels of adsorbed species

CT DEFECT STATES; ELEMENTAL SEMICONDUCTORS; ION BEAM EFFECTS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; PHOTOEXCITATION; REFLECTIVITY; \*\*\*SILICON\*\*\* ; SURFACE RECOMBINATION; SURFACE STATES; TIME RESOLVED SPECTRA; VISIBLE SPECTRA

ST \*\*\*transient reflecting grating spectroscopy\*\*\* ; semiconductor surface region; \*\*\*ion-implanted silicon\*\*\* ; defect analysis; ultrafast spectroscopy; trapped carriers; defect states; ultrafast carrier dynamics; many-body recombination; interband transition; defect-related transitions; implantation damage; photoexcited carriers; dose quantity dependence; crossed pump pulses; reflectance spectra; Auger recombination; \*\*\*Si\*\*\*

CHI Si sur, Si el  
 ET Si

L7 ANSWER 115 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 2002:7397696 INSPEC DN A2002-22-6842-002  
 TI Investigation of the dynamics of phase transitions on \*\*\*silicon\*\*\* surface at light pulse heating.

AU Fattakhov, Ya.V.; Galyautdinov, M.F.; L'vova, T.N.; Zakharov, M.V.; Khaibullin, I.B. (Physicotech. Inst., Acad. of Sci., Kazan, Russia)

SO Proceedings of the SPIE - The International Society for Optical Engineering (2001) vol.4605, p.399-408. 9 refs.  
 Published by: SPIE-Int. Soc. Opt. Eng  
 Price: CCCC 0277-786X/01/\$15.00  
 CODEN: PSISDG ISSN: 0277-786X  
 SICI: 0277-786X(2001)4605L:399:IDPT;1-Z  
 Conference: PECS 2001: Photon Echo and Coherent Spectroscopy. Novgorod, Russia, 20-24 June 2001  
 Sponsor(s): SPIE

DT Conference Article; Journal  
 TC Experimental  
 CY United States  
 LA English  
 AB The nucleation and growth of local molten regions (LMRs) during light irradiation was detected using a high-speed camera and long-focus microscope. In situ dependences of sizes and density (quantity per cm<sup>-2</sup>) of LMRs are interpreted in the framework of the following model. A great amount of heat is transferred to the semiconductor surface during light pulse irradiation. This process is nonstationary and the heat is not distributed homogeneously over the thickness of the sample. As a result, a specific short-lived state is formed, in which the semiconductor surface is superheated in the solid-state phase with respect to the equilibrium melting temperature. Some surface areas, which contain the defects, begin to melt. The temperature of these local molten regions immediately decreases down to the equilibrium melting temperature. The created LMRs begin to absorb the heat from neighboring superheated solid regions. As a result, the temperature of superheated regions decreases down to the equilibrium melting point. No new local molten regions are formed and the sizes of existing local molten regions increase due to absorption of the energy of light pulse. To study the main features of local melting in more detail in-situ investigations of the mechanism of this effect were carried out at incoherent light irradiation with different pulse durations and irradiation power densities. The latter of our results agree with the

superheating model. Also the dynamics of phase transitions on the surface of implanted \*\*\*silicon\*\*\* for different regimes of light pulses is investigated using a high-speed camera and special diffraction \*\*\*gratings\*\*\*. The diffraction \*\*\*gratings\*\*\* were formed using \*\*\*ion\*\*\* \*\*\*implantation\*\*\* and the effect of local melting. The dynamics of diffraction during and after the light pulse irradiation was studied.

CC A6842 Surface phase transitions and critical phenomena; A6470D Solid-liquid transitions; A4280F Gratings, echelles; A6170T Doping and implantation of impurities; A6180B Ultraviolet, visible and infrared radiation effects

CT DIFFRACTION \*\*\*GRATINGS\*\*\*; HEAT TRANSFER; HIGH-SPEED OPTICAL TECHNIQUES; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\*; LASER BEAM EFFECTS; MELTING; NUCLEATION; RADIATION EFFECTS; \*\*\*SILICON\*\*\*; SURFACE PHASE TRANSFORMATIONS

ST \*\*\*silicon surface\*\*\*; light pulse heating; phase transition dynamics; nucleation; growth; local molten regions; light irradiation; high-speed camera; long-focus microscope; sizes; density; semiconductor surface; nonstationary process; short-lived state; solid-state phase; equilibrium melting temperature; surface areas; defects; neighboring superheated solid regions; absorption; incoherent light irradiation; pulse durations; irradiation power densities; surface phase transitions; \*\*\*diffraction\*\*\*

\*\*\* gratings\*\*\*; \*\*\*ion implantation\*\*\*; local melting; flash lamps; \*\*\*Si\*\*\*

CHI Si sur, Si el  
ET Si

L7 ANSWER 116 OF 187 INSPEC (C) 2006 IEE on STN  
AN 2002:7367379 INSPEC DN B2002-10-7230M-063; C2002-10-3240P-004  
TI \*\*\*Si\*\*\* micromachined optical encoder based on \*\*\*grating\*\*\* imaging.

AU Hane, K.; Endo, T.; Ito, Y.; Sasaki, M. (Dept. Mechatronics & Precision Eng., Tohoku Univ., Sendai, Japan)

SO TRANSDUCERS '01. EUROSensors XV. 11th International Conference on Solid-State Sensors and Actuators. Digest of Technical Papers  
Editor(s): Obermeier, E.  
Berlin, Germany: Springer-Verlag, 2001. p.552-5 vol.1 of 2 vol. 1807 pp. 9 refs.  
Conference: Munich, Germany, 10-14 June 2001  
ISBN: 3-540-42150-5

DT Conference Article  
TC Application; Practical; Theoretical; Experimental  
CY Germany, Federal Republic of  
LA English  
AB Using micromachining technique, an integrated optical encoder has been fabricated for the measurement of linear displacement. \*\*\*Grating\*\*\* imaging phenomenon has been used in the displacement sensing. The index \*\*\*grating\*\*\* of the sensor consists of the transmission type \*\*\*Si\*\*\* grids, which are etched through by the reactive ion plasma. On the \*\*\*Si\*\*\* grids, arrays of line photo-detectors are installed by \*\*\*ion\*\*\* \*\*\*implantation\*\*\*. The two \*\*\*gratings\*\*\*, photo-detectors, light emitting diode, and preamplifier circuit chip are stacked perpendicularly to the optical axis. The encoder signal with a high contrast has been obtained from the integrated sensor.

CC B7230M Microsensors; B2550E Surface treatment (semiconductor technology); B7320C Spatial variables measurement; B4145 Micro-optical devices and technology; B2575F Fabrication of micromechanical devices; C3240P Microsensors; C3240F Nonelectric transducers and sensing devices

CT DISPLACEMENT MEASUREMENT; ELEMENTAL SEMICONDUCTORS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\*; LIGHT EMITTING DIODES; MICRO-OPTICS; MICROMACHINING; MICROSENSORS; OPTICAL SENSORS; PHOTODETECTORS; PREAMPLIFIERS; SPUTTER ETCHING

ST micromachined optical encoder; \*\*\*Si\*\*\*; \*\*\*grating imaging\*\*\*; linear displacement; displacement sensing; transmission type grids; reactive ion plasma; line photo-detectors; \*\*\*ion implantation\*\*\*; light emitting diode; preamplifier circuit chip; optical axis; encoder signal; contrast

CHI Si int, Si el  
ET Si

L7 ANSWER 117 OF 187 INSPEC (C) 2006 IEE on STN  
AN 2002:7332546 INSPEC DN A2002-17-7847-004

TI Transient reflecting \*\*\*grating\*\*\* spectroscopy for defect analysis of surface region of semiconductors.  
 AU Donen, H.; Katayama, K.; Sawada, T. (Dept. of Adv. Mater. Sci., Univ. of Tokyo, Japan)  
 SO Journal of Applied Physics (1 Aug. 2002) vol.92, no.3, p.1367-71. 28 refs. Doc. No.: S0021-8979(02)05716-X  
 Published by: AIP  
 Price: CCCC 0021-8979/2002/92(3)/1367(5)/\$19.00  
 CODEN: JAPIAU ISSN: 0021-8979  
 SICI: 0021-8979(20020801)92:3L:1367:TRGS;1-M  
 DT Journal  
 TC Experimental  
 CY United States  
 LA English  
 AB Ultrafast transient reflecting \*\*\*grating\*\*\* (TRG) spectroscopy was applied to investigate the influence of various defect states on ultrafast carrier dynamics of up to 3 ps duration in an \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* surface region. The TRG spectra revealed the energy-state distribution of two kinds of defect states, and it was observed that photoexcited carriers were trapped in each state depending on annealing time. It was proposed that TRG spectroscopy can be used as an analytical method for characterizing defects in the surface region of semiconductors.  
 CC A7847 Ultrafast optical measurements in condensed matter; A7320H Surface impurity and defect levels; energy levels of adsorbed species; A6170T Doping and implantation of impurities; A6170A Annealing processes  
 CT ANNEALING; DEFECT STATES; ELEMENTAL SEMICONDUCTORS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; \*\*\*SILICON\*\*\* ; SURFACE STATES; TIME RESOLVED SPECTRA  
 ST semiconductor; \*\*\*ultrafast transient reflecting grating spectroscopy\*\*\* ; defect states; carrier dynamics; \*\*\*ion-implanted silicon surface\*\*\* ; energy state distribution; annealing; 3 ps; \*\*\*Si\*\*\*  
 CHI Si sur, Si el  
 PHP time 3.0E-12 s  
 ET Si  
 L7 ANSWER 118 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 2002:7206315 INSPEC DN A2002-08-6180B-002  
 TI Study of phase transition dynamics on semiconductor surface at light pulse irradiation.  
 AU Fattakhov, Y.V.; Galyautdinov, M.F.; Lvova, T.N.; Khalibullin, I.B. (Kazan Physical-Technical Inst., Acad. of Sci., Kazan, Russia)  
 SO Proceedings of the SPIE - The International Society for Optical Engineering (2001) vol.4183, p.531-8. 5 refs.  
 Published by: SPIE-Int. Soc. Opt. Eng  
 Price: CCCC 0277-786X/01/\$15.00  
 CODEN: PSISDG ISSN: 0277-786X  
 SICI: 0277-786X(2001)4183L:531:SPTD;1-4  
 Conference: 24th International Congress on High-Speed Photography and Photonics. Sendai, Japan, 24-29 Sept 2000  
 Sponsor(s): SPIE  
 DT Conference Article; Journal  
 TC Experimental  
 CY United States  
 LA English  
 AB The dynamics of anisotropic local melting of monocrystalline and implanted \*\*\*silicon\*\*\* at different regimes of light pulse irradiation was investigated. The results of in situ investigation of local melting of monocrystalline \*\*\*silicon\*\*\* were carried out for the first time using special long-focus microscope and high-speed camera The time dependences of the density and sizes of local molten regions were systematically measured We explain the increase of the size of LMRs during short time by superheating of the semiconductor in the solid state with respect to the equilibrium melting point. Due to superheating, conditions arise to overcome the barrier for the formation of the liquid phase nuclei. The dynamics of anisotropic local melting of implanted \*\*\*silicon\*\*\* was investigated using several optical methods and special diffraction \*\*\*gratings\*\*\* . The intensity of diffraction picture depends on the contrast of this periodical structure, i.e. from difference of crystalline and amorphous fragments of \*\*\*gratings\*\*\* . The dynamics of diffraction effectivity daring and after the power light pulse was registered using high-speed camera. Three qualitative stages: solid-state



recrystallization, local melting and liquid-phase recrystallization were observed experimentally.

CC A6180B Ultraviolet, visible and infrared radiation effects; A6470D Solid-liquid transitions; A6842 Surface phase transitions and critical phenomena; A6170A Annealing processes

CT ELEMENTAL SEMICONDUCTORS; INCOHERENT LIGHT ANNEALING; \*\*\*ION\*\*\*  
 \*\*\*IMPLANTATION\*\*\* ; MELTING; OPTICAL MICROSCOPY; RADIATION EFFECTS;  
 \*\*\*SILICON\*\*\* ; SURFACE PHASE TRANSFORMATIONS

ST anisotropic local melting dynamics; \*\*\*monocrystalline silicon\*\*\* ;  
 light pulse irradiation; high-speed camera; long-focus microscopy; time dependences; superheating; equilibrium melting point; \*\*\*implanted\*\*\*  
 \*\*\* silicon\*\*\* ; diffraction picture; periodical structure; solid-state recrystallization; liquid-phase recrystallization; phase transition dynamics; \*\*\*Si\*\*\*

CHI Si sur, Si el  
 ET Si

L7 ANSWER 119 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 2001:7071232 INSPEC DN A2001-23-7855-010  
 TI \*\*\*Si\*\*\* -doped luminescence \*\*\*gratings\*\*\* .  
 AU Heitmann, J. (Max-Planck-Inst. fur Mikrostrukturphys. Exp. Dept. II, Halle, Germany); McCallum, J.C.; Meijer, J.; Stephan, A.; Butz, T.; Zacharias, M.  
 SO Nuclear Instruments & Methods in Physics Research, Section B (Beam Interactions with Materials and Atoms) (July 2001) vol.181, p.263-7. 16 refs.  
 Doc. No.: S0168-583X(01)00367-6  
 Published by: Elsevier  
 Price: CCCC 0168-583X/2001/\$20.00  
 CODEN: NIMBEU ISSN: 0168-583X  
 SICI: 0168-583X(200107)181L:263:DLG;1-1  
 Conference: 7th International Conference on Nuclear Microprobe Technology and Applications. Bordeaux, France, 10-15 Sept 2000

DT Conference Article; Journal  
 TC Experimental  
 CY Netherlands  
 LA English

AB We report on the fabrication of ordered arrays of dots formed by  
 \*\*\*Si\*\*\* implantation through a grid into SiO<sub>2</sub> using the Bochum high-energy \*\*\*ion\*\*\* projector. Arrays of \*\*\*Si\*\*\* -  
 \*\*\*implanted\*\*\* dots with dimensions in the micrometer and submicrometer range have been made. The samples show a strong red photoluminescence at room temperature. By the combination of  $\mu$ -photoluminescence measurements and atomic force microscopy investigations optical and structural characterization of the produced structures was possible. Additional investigations by high-resolution transmission electron microscopy, X-ray diffraction and temperature-dependent photoluminescence on conventionally implanted samples have been performed for comparison.

CC A7855C Photoluminescence in elemental semiconductors; A4280F Gratings, echelles; A6170T Doping and implantation of impurities

CT ATOMIC FORCE MICROSCOPY; DIFFRACTION \*\*\*GRATINGS\*\*\* ; ELEMENTAL SEMICONDUCTORS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; NANOSTRUCTURED MATERIALS; PHOTOLUMINESCENCE; \*\*\*SILICON\*\*\* ; TRANSMISSION ELECTRON MICROSCOPY; X-RAY DIFFRACTION

ST \*\*\*luminescence grating\*\*\* ; fabrication; \*\*\*Si nanodot array\*\*\* ;  
 \*\*\*ion implantation\*\*\* ; SiO<sub>2</sub> grid; Bochum high-energy ion projector; photoluminescence; micro-photoluminescence; atomic force microscopy; high-resolution transmission electron microscopy; X-ray diffraction; temperature dependence; \*\*\*Si doping\*\*\* ; \*\*\*SiO<sub>2</sub>:Si\*\*\*

CHI SiO<sub>2</sub>:Si bin, SiO<sub>2</sub> bin, O<sub>2</sub> bin, Si bin, O bin, Si el, Si dop  
 ET Si; O\*Si; SiO<sub>2</sub>; Si cp; cp; O cp; O sy 2; sy 2; Si sy 2; SiO<sub>2</sub>:Si; Si doping; doped materials; SiO; O

L7 ANSWER 120 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 2001:7054691 INSPEC DN A2001-21-4280F-013  
 TI In situ investigation of phase transitions of implanted \*\*\*silicon\*\*\* at powerful light irradiation.  
 AU Fattakhov, Ya.V.; Galyautdinov, M.F.; L'vova, T.N.; Khaibullin, I.B. (Acad. of Sci., Kazan, Russia)  
 SO Vacuum (16 Aug. 2001) vol.63, no.4, p.649-55. 10 refs.  
 Doc. No.: S0042-207X(01)00253-6  
 Published by: Elsevier  
 Price: CCCC 0042-207X/2001/\$20.00

CODEN: VACUAV ISSN: 0042-207X

SICI: 0042-207X(20010816)63:4L:649:SIPT;1-Z

Conference: International Symposium 'Ion Implantation and Other Applications of Ions and Electrons - ION 2000'. Kazimierz Dolny o/Wisla, Poland, 12-15 June 2000

DT Conference Article; Journal

TC Experimental

CY United Kingdom

LA English

AB The in situ investigations of anisotropic local melting of implanted and monocrystalline \*\*\*silicon\*\*\* during irradiation by powerful light pulses using a high-speed camera are presented. The methods of formation of special diffraction \*\*\*gratings\*\*\* are presented. The features of application of the \*\*\*gratings\*\*\* for the in situ investigation of structural and phase transitions of implanted \*\*\*silicon\*\*\* are discussed. One-dimensional \*\*\*gratings\*\*\* were formed by \*\*\*ion\*\*\* \*\*\*implantation\*\*\* and a special regime of laser annealing. The two-dimensional \*\*\*gratings\*\*\* were formed by \*\*\*ion\*\*\* \*\*\*implantation\*\*\* through a metallic net shadow-mark or using photolithography. Also, the first results of in situ investigation of the effect of anisotropic local melting of monocrystalline \*\*\*silicon\*\*\* are presented. In situ time dependences of density (quantity per cm<sup>2</sup>) of local molten regions are interpreted in the frame of a model which describes the existence of a short-lived metastable state, characterized by superheating in the solid phase. The experiments and theoretical calculations crucial to clarify the mechanism of this effect are discussed.

CC A4280F Gratings, echelles; A6170T Doping and implantation of impurities; A6180J Ion beam effects; A6180B Ultraviolet, visible and infrared radiation effects; A6170A Annealing processes; A6842 Surface phase transitions and critical phenomena

CT DIFFRACTION \*\*\*GRATINGS\*\*\*; ELEMENTAL SEMICONDUCTORS; HEAT TRANSFER; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\*; LASER BEAM ANNEALING; MELTING; PHOSPHORUS; PHOTOLITHOGRAPHY; RADIATION EFFECTS; \*\*\*SILICON\*\*\*; SURFACE PHASE TRANSFORMATIONS

ST phase transitions; \*\*\*implanted silicon\*\*\*; light irradiation; anisotropic local melting; \*\*\*monocrystalline silicon\*\*\*; \*\*\*diffraction gratings\*\*\*; structural transition; \*\*\*one-dimensional\*\*\* \*\*\*gratings\*\*\*; \*\*\*ion implantation\*\*\*; laser annealing; metallic net shadow-mark; photolithography; local molten region density; short-lived metastable state; solid phase superheating; \*\*\*Si:P\*\*\*

CHI Si:P sur, Si sur, P sur, Si:P bin, Si bin, P bin, Si el, P el, P dop

ET In; P\*Si; Si:P; P doping; doped materials; Si; P

L7 ANSWER 121 OF 187 INSPEC (C) 2006 IEE on STN

AN 2001:7048800 INSPEC DN B2001-11-2550B-006

TI Pattern writing by implantation in a large-scale PSII system with planar inductively coupled plasma source.

AU Lingling Wu (Appl. Sci. Dept., Coll. of William & Mary, Williamsburg, VA, USA); Hongjun Gao; Manos, D.M.

SO Materials Development for Direct Write Technologies. Symposium (Materials Research Society Symposium Proceedings Vol.624)

Editor(s): Chrisey, D.B.; Gamota, D.R.; Helvajian, H.; Taylor, D.P.

Warrendale, PA, USA: Mater. Res. Soc, 2000. p.205-10 of xiv+283 pp. 12 refs.

Conference: San Francisco, CA, USA, 24-26 April 2000

ISBN: 1-55899-532-3

DT Conference Article

TC Practical; Theoretical; Experimental

CY United States

LA English

AB A large-scale plasma source immersion \*\*\*ion\*\*\* \*\*\*implantation\*\*\* (PSII) system with planar coil RFI plasma source has been used to study an inkless, deposition-free, mask-based surface conversion patterning as an alternative to direct writing techniques on large-area substrates by implantation. The apparatus has a 0.61 m ID and 0.51 m tall chamber, with a base pressure in the 10<sup>-8</sup> torr range, making it one of the largest PSII presently available. The system uses a 0.43 m ID planar RF antenna to produce dense plasma capable of large-area uniform materials treatment. Metallic and semiconductor samples have been implanted through masks to produce small geometric patterns of interest for device manufacturing. \*\*\*Si\*\*\* \*\*\*gratings\*\*\* were also implanted to study application to

smaller features. Samples are characterized by AES, TEM and variable-angle spectroscopic ellipsometry. Composition depth profiles obtained by AES and VASE are compared. Measured lateral and depth profiles are compared to the mask features to assess lateral diffusion. Pattern transfer fidelity, and wall-effects. The paper also presents the results of MAGIC EM particle-in-cell FDTD plasma physics process simulation code calculations of the flux and angle of ion trajectories through the boundary layer predicting the magnitude of flux as a function of 3D location on objects in the expanding sheath.

CC B2550B Semiconductor doping; B2550G Lithography (semiconductor technology); B2570 Semiconductor integrated circuits; B2550X Semiconductor process modelling and simulation; B0290Z Other numerical methods

CT AUGER ELECTRON SPECTRA; ELLIPSOMETRY; FINITE DIFFERENCE TIME-DOMAIN ANALYSIS; INTEGRATED CIRCUIT MEASUREMENT; \*\*\*ION\*\*\*

\*\*\*IMPLANTATION\*\*\* ; MASKS; PLASMA MATERIALS PROCESSING; PLASMA RADIOFREQUENCY HEATING; SEMICONDUCTOR PROCESS MODELLING; TRANSMISSION ELECTRON MICROSCOPY

ST pattern writing; implantation; large-scale PSII system; planar inductively coupled plasma source; \*\*\*large-scale plasma source immersion ion\*\*\*

\*\*\* implantation system\*\*\* ; planar coil RFI plasma source; inkless deposition-free mask-based surface conversion patterning; direct writing techniques; large-area substrates; chamber size; base pressure; planar RF antenna; dense plasma; large-area uniform materials treatment; semiconductor samples; metallic samples; masks; geometric patterns; device manufacturing; \*\*\*Si gratings\*\*\* ; feature size; AES; TEM; variable-angle spectroscopic ellipsometry; composition depth profiles; VASE; depth profiles; lateral profiles; pattern transfer fidelity; mask features; lateral diffusion; wall-effects; MAGIC EM particle-in-cell FDTD plasma physics process simulation; ion trajectory angle; ion flux; boundary layer; ion flux magnitude; expanding plasma sheath; 0.61 m; 0.51 m; 0.00001 mtorr; 0.43 m

PHP size 6.1E-01 m; size 5.1E-01 m; pressure 1.3E-06 Pa; size 4.3E-01 m

ET Si; D

L7 ANSWER 122 OF 187 INSPEC (C) 2006 IEE on STN

AN 2001:7008207 INSPEC DN A2001-18-7860F-005; B2001-09-4260-011

TI Efficient blue light emission from \*\*\*silicon\*\*\* : the first integrated \*\*\*Si\*\*\* -based optocoupler.

AU Rebohle, L. (Inst. für Ionenstrahlphysik und Materialforschung, Forschungszentrum Rossendorf eV, Dresden, Germany); von Borany, J.; Borchert, D.; Frob, H.; Gebel, T.; Helm, M.; Möller, W.; Skorupa, W.

SO Electrochemical and Solid-State Letters (July 2001) vol.4, no.7, p.G57-60. 23 refs.

Doc. No.: S1099-0062(01)00707-6

Published by: Electrochem. Soc

Price: CCCC 1099-0062/2001/4(7)/57/4/\$7.00

CODEN: ESLEF6 ISSN: 1099-0062

SICI: 1099-0062(200107)4:7L;g57:EBLE;1-7

DT Journal

TC Practical; Experimental

CY United States

LA English

AB We present the first all- \*\*\*silicon\*\*\* integrated optocoupler, whose fabrication, using \*\*\*ion\*\*\* \*\*\*implantation\*\*\* into SiO<sub>2</sub>, is completely compatible with standard \*\*\*Si\*\*\* technology. It is based on Ge-implanted SiO<sub>2</sub> layers as light emitter exhibiting bright blue-violet electroluminescence light with a record wall-plug efficiency of 0.5%. The electroluminescence is explained with a model in which electrons enter the SiO<sub>2</sub> layer via tunnel injection and excite the luminescence centers by impact excitation or field ionization. A radiative T<sub>1</sub>-S<sub>0</sub> transition of these luminescence centers then causes the observed electroluminescence. Finally, we show that these optocoupling devices hold great promise for integrated optoelectronic applications, especially in the field of sensor and biotechnology.

CC A7860F Electroluminescence (condensed matter); A6170T Doping and implantation of impurities; A4280L Optical waveguides and couplers; A4281M Fibre couplers and connectors; A7865P Optical properties of other inorganic semiconductors and insulators (thin films/low-dimensional structures); B4260 Electroluminescent devices; B4270 Integrated optoelectronics

CT ELECTROLUMINESCENCE; ELEMENTAL SEMICONDUCTORS; GERMANIUM; INTEGRATED OPTOELECTRONICS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; LIGHT EMITTING

DEVICES; LUMINESCENT DEVICES; OPTICAL \*\*\*COUPLERS\*\*\* ; \*\*\*SILICON\*\*\*  
; \*\*\*SILICON\*\*\* COMPOUNDS  
ST efficient blue light emission; \*\*\*integrated Si-based optocoupler\*\*\* ;  
\*\*\*ion implantation into SiO<sub>2</sub>\*\*\* ; Ge-implanted SiO<sub>2</sub> layers; bright  
blue-violet electroluminescence light; wall-plug efficiency; tunnel  
injection; luminescence centers; impact excitation; field ionization; 0.5  
percent; \*\*\*Si-SiO<sub>2</sub>:Ge\*\*\*  
CHI Si-SiO<sub>2</sub>:Ge int, SiO<sub>2</sub>:Ge int, SiO<sub>2</sub> int, Ge int, O<sub>2</sub> int, Si int, O int,  
SiO<sub>2</sub>:Ge ss, SiO<sub>2</sub> ss, Ge ss, O<sub>2</sub> ss, Si ss, O ss, SiO<sub>2</sub> bin, O<sub>2</sub> bin, Si bin,  
O bin, Ge el, Si el, Ge dop  
PHP efficiency 5.0E-01 percent  
ET Si; O\*Si; SiO<sub>2</sub>; Si cp; cp; O cp; Ge; S\*T; T1-S0; Ge\*O\*Si; Ge sy 3; sy 3; O  
sy 3; Si sy 3; SiO<sub>2</sub>:Ge; Ge doping; doped materials; Si-SiO<sub>2</sub>:Ge; O sy 2; sy  
2; Si sy 2; SiO; Si-SiO; O

L7 ANSWER 123 OF 187 INSPEC (C) 2006 IEE on STN  
AN 2001:6980420 INSPEC DN A2001-16-0630C-007; B2001-08-7320C-027  
TI A compact optical encoder with micromachined photodetector.  
AU Hane, K.; Endo, T.; Ito, Y.; Sasaki, M. (Dept. of Mechatronics & Precision  
Eng., Tohoku Univ., Sendai, Japan)  
SO Journal of Optics A: Pure and Applied Optics (May 2001) vol.3, no.3,  
p.191-5. 8 refs.  
Doc. No.: S1464-4258(01)19068-9  
Published by: IOP Publishing  
Price: CCCC 1464-4258/2001/030191+05\$30.00  
CODEN: JOAOF8 ISSN: 1464-4258  
SICI: 1464-4258(200105)3:3L.191:COEW;1-F

DT Journal  
TC New Development; Practical; Theoretical; Experimental  
CY United Kingdom  
LA English  
AB A compact optical encoder has been fabricated using a micromachining  
technique for the measurement of linear displacement. The index  
\*\*\*grating\*\*\* for detecting the Moire signal from the superimposed  
\*\*\*gratings\*\*\* consists of transmission type \*\*\*silicon\*\*\* grids,  
which are etched through by the reactive ion plasma. An array of line  
photodetectors is installed on the \*\*\*silicon\*\*\* grids by \*\*\*ion\*\*\*  
\*\*\*implantation\*\*\*. A scale \*\*\*grating\*\*\* is illuminated by the  
light passing through the slits of the transmission index \*\*\*grating\*\*\*  
, and thus the light source can be placed just behind the index  
\*\*\*grating\*\*\*. Therefore the structure of the proposed optical encoder  
is compact. In the experiment, the second order \*\*\*grating\*\*\* imaging  
phenomenon under incoherent illumination has been applied to displacement  
sensing. An encoder signal with high contrast is obtained at a large air  
gap between the two \*\*\*gratings\*\*\*.

CC A0630C Spatial variables measurement; A0762 Detection of radiation  
(bolometers, photoelectric cells, i.r. and submillimetre waves detection);  
A4280F Gratings, echelles; A0760L Optical interferometry; A8160C Surface  
treatment and degradation in semiconductor technology; A4282 Integrated  
optics; B7320C Spatial variables measurement; B7230C Photodetectors;  
B2550E Surface treatment (semiconductor technology); B2575F Fabrication of  
micromechanical devices; B4140 Integrated optics

CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; DISPLACEMENT MEASUREMENT; INTEGRATED  
OPTICS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; MICROMACHINING; MOIRE  
FRINGES; OPTICAL IMAGES; OPTICAL SENSORS; PHOTODETECTORS; \*\*\*SILICON\*\*\*  
; SPUTTER ETCHING

ST compact optical encoder; micromachined photodetector; linear displacement  
measurement; \*\*\*index grating\*\*\* ; Moire signal; \*\*\*superimposed\*\*\*  
\*\*\*gratings\*\*\* ; \*\*\*transmission type silicon grids\*\*\* ; reactive ion  
plasma; etching; line photodetector array; \*\*\*ion implantation\*\*\* ;  
\*\*\*scale grating\*\*\* ; \*\*\*transmission index grating slits\*\*\* ; light  
source; \*\*\*second order grating imaging phenomenon\*\*\* ; incoherent  
illumination; displacement sensing; encoder signal; high contrast; large  
air gap; \*\*\*Si\*\*\*

CHI Si int, Si el  
ET Si

L7 ANSWER 124 OF 187 INSPEC (C) 2006 IEE on STN  
AN 2001:6932293 INSPEC DN A2001-13-4260B-001; B2001-07-4320J-010  
TI Virtual mesa and spoiler midinfrared angled- \*\*\*grating\*\*\* distributed  
feedback lasers fabricated by \*\*\*ion\*\*\* \*\*\*bombardment\*\*\* .  
AU Bartolo, R.E.; Bewley, W.W.; Felix, C.L.; Vurgaftman, I.; Lindle, J.R.;

Meyer, J.R.; Knies, D.L.; Grabowski, K.S. (Naval Res. Lab., Washington, DC, USA); Turner, G.W.; Manfra, M.J.  
SO Applied Physics Letters (28 May 2001) vol.78, no.22, p.3394-6. 12 refs.  
Doc. No.: S0003-6951(01)05322-0  
Published by: AIP  
Price: CCCC 0003-6951/2001/78(22)/3394(3)/\$18.00  
CODEN: APPLAB ISSN: 0003-6951  
SICI: 0003-6951(20010528)78:22L:3394:VMSM;1-E

DT Journal  
TC Practical; Experimental  
CY United States  
LA English  
AB It is demonstrated that the suppression of parasitic Fabry-Perot-like  
lasing modes substantially enhances the beam quality and brightness of  
wide-stripe angled- \*\*\*grating\*\*\* distributed feedback lasers emitting  
in the midwave infrared. The direct facet-to-facet gain path is blocked by  
loss regions that are created by \*\*\*ion\*\*\* \*\*\*bombardment\*\*\* with  
900 keV \*\*\*silicon\*\*\* \*\*\*ions\*\*\*. Both virtual mesa structures, in  
which loss regions bound both sides of the 300-  $\mu$ m-wide angled gain  
path, and spoiler structures, in which loss is induced only near the  
facets, decrease the etendue of the output by nearly an order of  
magnitude, and increase the brightness by up to a factor of 3.

CC A4260B Design of specific laser systems; A4255P Lasing action in  
semiconductors; A4285D Optical fabrication, surface grinding; A4280F  
Gratings, echelles; A6180J Ion beam effects; B4320J Semiconductor lasers;  
B2550R Radiation effects on semiconductor devices

CT BRIGHTNESS; DIFFRACTION \*\*\*GRATINGS\*\*\*; DISTRIBUTED FEEDBACK LASERS;  
ION BEAM EFFECTS; LASER BEAMS; LASER MODES; LASER TRANSITIONS; OPTICAL  
FABRICATION; QUANTUM WELL LASERS

ST \*\*\*spoiler midinfrared angled-grating distributed feedback lasers\*\*\*;  
\*\*\*ion bombardment\*\*\*; parasitic Fabry-Perot-like lasing mode  
suppression; beam quality; brightness; \*\*\*wide-stripe angled-grating\*\*\*  
\*\*\* distributed feedback lasers\*\*\*; midwave infrared; direct facet-to-facet  
gain path; loss regions; \*\*\*900 keV silicon ions\*\*\*; virtual mesa  
structures; spoiler structures; facets; 900 keV; 300  $\mu$ m; \*\*\*Si\*\*\*;  
InAs-GaInSb-InAs-AlAsSb

CHI Si el; InAs-GaInSb-InAs-AlAsSb int, AlAsSb int, GaInSb int, InAs int, Al  
int, As int, Ga int, In int, Sb int, AlAsSb ss, GaInSb ss, Al ss, As ss,  
Ga ss, In ss, Sb ss, InAs bin, As bin, In bin

PHP electron volt energy 9.0E+05 eV; size 3.0E-04 m

ET Si; Al\*As\*Ga\*In\*Sb; Al sy 5; sy 5; As sy 5; Ga sy 5; In sy 5; Sb sy 5;  
InAs; In cp; cp; As cp; GaInSb; Ga cp; Sb cp; AlAsSb; Al cp;  
InAs-GaInSb-InAs-AlAsSb; Al\*As\*Sb; Al sy 3; sy 3; As sy 3; Sb sy 3;  
Ga\*In\*Sb; Ga sy 3; In sy 3; As\*In; As sy 2; sy 2; In sy 2; Al; As; Ga; In;  
Sb

L7 ANSWER 125 OF 187 INSPEC (C) 2006 IEE on STN

AN 2000:6751948 INSPEC DN A2000-24-4281B-001; B2000-12-4125-029

TI \*\*\*Ion\*\*\* - \*\*\*implantation\*\*\* -induced densification in silica-based  
glass for fabrication of optical fiber \*\*\*gratings\*\*\*.

AU Fujimaki, M.; Nishihara, Y.; Ohki, Y. (Dept. of Electr. Eng. & Comput.  
Eng., Waseda Univ., Tokyo, Japan); Brebner, J.L.; Roorda, S.

SO Journal of Applied Physics (15 Nov. 2000) vol.88, no.10, p.5534-7. 30  
refs.  
Doc. No.: S0021-8979(00)03922-0  
Published by: AIP  
Price: CCCC 0021-8979/2000/88(10)/5534(4)/\$17.00  
CODEN: JAPIAU ISSN: 0021-8979  
SICI: 0021-8979(20001115)88:10L:5534:IIDS;1-W

DT Journal  
TC Experimental  
CY United States  
LA English  
AB \*\*\*Ion\*\*\* \*\*\*implantation\*\*\* induces a refractive index increase  
in silica-based glass, which is mainly due to densification of the glass.  
The refractive index increase can be used to fabricate optical fiber  
\*\*\*gratings\*\*\* that are formed with periodic refractive index modulation  
in the core of an optical fiber. In this article, the generation mechanism  
of the densification has been investigated through measurements of  
thickness changes of silica glass induced by proton and He2+ \*\*\*ion\*\*\*  
\*\*\*implantation\*\*\*. Furthermore, fabrication of the optical fiber  
\*\*\*grating\*\*\* using the refractive index increase has been demonstrated.

From the result, ideal implantation conditions to fabricate the  
 \*\*\*gratings\*\*\* are discussed.

CC A4281B Optical fibre fabrication, cladding, splicing, joining; A6140D  
 Structure of glasses; A8120E Powder techniques, compaction and sintering;  
 A8120P Preparation of glasses; A6180J Ion beam effects; A4281H  
 Gradient-index (GRIN) fibre devices and techniques; A7820D Optical  
 constants and parameters (condensed matter); A4280F Gratings, echelles;  
 B4125 Fibre optics; B0570 Glasses (engineering materials science)

CT DENSIFICATION; DIFFRACTION \*\*\*GRATINGS\*\*\* ; GLASS; GRADIENT INDEX  
 OPTICS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; OPTICAL FIBRE FABRICATION;  
 REFRACTIVE INDEX; \*\*\*SILICON\*\*\* COMPOUNDS

ST \*\*\*ion implantation-induced densification\*\*\* ; silica-based glass;  
 \*\*\*optical fiber gratings fabrication\*\*\* ; refractive index increase;  
 periodic refractive index modulation; thickness changes; proton  
 implantation; \*\*\*He2+ ion implantation\*\*\* ; implantation conditions;  
 SiO2:He; SiO2:H

CHI SiO2:He ss, SiO2 ss, He ss, O2 ss, Si ss, O ss, SiO2 bin, O2 bin, Si bin,  
 O bin, He el, He dop; SiO2:H ss, SiO2 ss, O2 ss, Si ss, H ss, O ss, SiO2  
 bin, O2 bin, Si bin, O bin, H el, H dop; SiO2 ss, He ss, O2 ss, Si ss, O  
 ss, He el, He dop; SiO2 ss, O2 ss, Si ss, H ss, O ss, H el, H dop

ET He; He2+; He ip 2; ip 2; He\*O\*Si; He sy 3; sy 3; O sy 3; Si sy 3; SiO2:He;  
 He doping; doped materials; Si cp; cp; O cp; H\*O\*Si; SiO2:H; H doping;  
 O\*Si; SiO; O; Si; H

L7 ANSWER 126 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 2000:6729608 INSPEC DN A2000-22-0130C-031; B2000-11-0100-061  
 TI \*\*\*Silicon\*\*\* -based Optoelectronics II.  
 SO Proceedings of the SPIE - The International Society for Optical  
 Engineering (2000) vol.3953  
 Published by: SPIE-Int. Soc. Opt. Eng  
 Price: CCCC 00/\$15.00  
 CODEN: PSISDG ISSN: 0277-786X  
 Conference: Silicon-based Optoelectronics II. San Jose, CA, USA, 28 Jan  
 2000  
 Sponsor(s): SPIE

DT Conference Proceedings; Journal  
 CY United States  
 LA English

AB The following topics were dealt with: development and prospects of  
 \*\*\*SOI\*\*\* -based photonic components for optical CDMA application;  
 arrayed waveguide \*\*\*grating\*\*\* demultiplexers in \*\*\*SOI\*\*\* ;  
 optical sources, integrated optical detectors and optical waveguides in  
 standard \*\*\*silicon\*\*\* CMOS integrated circuitry; tunneling-induced  
 electroluminescence from MOS structures on \*\*\*Si\*\*\* ; self-assembled  
 InAs/ \*\*\*Si\*\*\* quantum dot stacks grown by molecular beam epitaxy;  
 light-emitting diodes fabricated in \*\*\*silicon\*\*\* /iron disilicide;  
 recent advances in miniaturization of infrared spectrometers; near-IR  
 wavemeter based on an array of polycrystalline Ge-on- \*\*\*Si\*\*\*  
 photodetectors; avalanche multiplication and noise in submicron \*\*\*Si\*\*\*  
 p-i-n diodes; Ge-on- \*\*\*Si\*\*\* high-responsivity near-IR photodetectors;  
 fabrication and characterization of porous \*\*\*silicon\*\*\* integrated  
 waveguides; low-loss small-cross-section \*\*\*Si\*\*\* -on- \*\*\*Si\*\*\* rib  
 waveguides with high-confining \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* lower  
 cladding; measurement and exploitation of the thermo-optic effect in  
 \*\*\*silicon\*\*\* for light switching in optoelectronic integrated circuits;  
 micromachined \*\*\*silicon\*\*\* actuators with low driving voltage and  
 high accuracy for optical switches and tunable filters; mechanical  
 properties of PECVD \*\*\*silicon\*\*\* oxide films suitable for integrated  
 optics applications; synthesis, photo, and pyrolytic properties of  
 polysilane photoresists; high quantum efficiency diode photodetector based  
 on ultrathin InGaAs-on- \*\*\*Si\*\*\* films.

CC A0130C Conference proceedings; A7865H Optical properties of elemental  
 semiconductors (thin films/low-dimensional structures); A7340Q Electrical  
 properties of metal-insulator-semiconductor structures; A0762 Detection of  
 radiation (bolometers, photoelectric cells, i.r. and submillimetre waves  
 detection); A4280L Optical waveguides and couplers; A4282 Integrated  
 optics; A7860F Electroluminescence (condensed matter); A0765G IR  
 spectroscopy and spectrometers; A4265P Optical bistability, multistability  
 and switching; A4280S Optical communication devices; A7820N Thermo-optical  
 effects (condensed matter); A0720 Thermal instruments and techniques;  
 B0100 General electrical engineering topics; B2520C Elemental  
 semiconductors; B2530F Metal-insulator-semiconductor structures; B6150E

Multiple access communication; B6260M Multiplexing and switching in optical communication; B7230C Photodetectors; B4130 Optical waveguides; B4140 Integrated optics; B2570D CMOS integrated circuits; B4220 Luminescent materials; B2530C Semiconductor superlattices, quantum wells and related structures; B4260D Light emitting diodes; B1310 Waveguides and striplines; B4180 Optical logic devices and optical computing techniques; B4340P Optical bistability, multistability and switching; B4270 Integrated optoelectronics; B8380M Microactuators; B2575F Fabrication of micromechanical devices

CT CMOS INTEGRATED CIRCUITS; CODE DIVISION MULTIPLE ACCESS; DEMULTIPLEXING EQUIPMENT; ELECTROLUMINESCENCE; ELEMENTAL SEMICONDUCTORS; INFRARED DETECTORS; INFRARED SPECTROMETERS; INTEGRATED OPTICS; INTEGRATED OPTOELECTRONICS; LIGHT EMITTING DIODES; MICROACTUATORS; MICROMACHINING; MIS STRUCTURES; OPTICAL PLANAR WAVEGUIDES; OPTICAL SWITCHES; PHOTODETECTORS; POROUS SEMICONDUCTORS; RIB WAVEGUIDES; SEMICONDUCTOR QUANTUM DOTS; \*\*\*SILICON\*\*\* ; \*\*\*SILICON\*\*\* -ON-INSULATOR; THERMO-OPTICAL EFFECTS

ST \*\*\*SOI\*\*\* ; optical CDMA; \*\*\*arrayed waveguide grating\*\*\*  
 \*\*\* demultiplexers\*\*\* ; optical sources; integrated optical detectors; optical waveguides; CMOS integrated circuit; tunneling-induced electroluminescence; MOS structures; quantum dot stacks; light-emitting diodes; infrared spectrometers; near-IR wavemeter; photodetectors; avalanche multiplication; \*\*\*submicron Si p-i-n diodes\*\*\* ; \*\*\*porous\*\*\*  
 \*\*\* silicon\*\*\* ; integrated waveguides; rib waveguides; thermo-optic effect; light switching; optoelectronic integrated circuits; \*\*\*micromachined\*\*\*  
 \*\*\* silicon actuators\*\*\* ; driving voltage; tunable filters; mechanical properties; PECVD; pyrolytic properties; polysilane photoresists; ultrathin films

ET Si; As\*In; As sy 2; sy 2; In sy 2; InAs; In cp; cp; As cp; Ge; As\*Ga\*In; As sy 3; sy 3; Ga sy 3; In sy 3; InGaAs; Ga cp

L7 ANSWER 127 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 2000:6711293 INSPEC DN A2000-21-6842-001  
 TI Formation of periodic diffraction structures at semiconductor surfaces for studying the dynamics of photoinduced phase transitions.  
 AU Fattakhov, Ya.V.; Galyautdinov, M.F.; L'vova, T.N.; Khaibullin, B. (Physicotech. Inst., Acad. of Sci., Kazan, Russia)  
 SO Optics and Spectroscopy (July 2000) vol.89, no.1, p.136-42. 12 refs. Published by: MAIK Nauka/Interperiodica Publishing  
 Price: CCCC 0030-400X/2000/8901-0136\$20.00  
 CODEN: OPSUA3 ISSN: 0030-400X  
 SICI (Trl): 0030-400X(200007)89:1L.136:FPDS;1-J  
 Translation of: Optika i Spektroskopiya (July 2000) vol.89, no.1, p.150-6. 12 refs.  
 CODEN: OSFMA3 ISSN: 0030-4034  
 SICI: 0030-4034(200007)89:1L.150;1-B

DT Journal; Translation Abstracted  
 TC Experimental  
 CY Russian Federation; Russian Federation  
 LA English  
 AB New methods for the formation of measuring periodic diffraction structures at \*\*\*silicon\*\*\* surfaces are proposed and tested. The one-dimensional \*\*\*grating\*\*\* is formed at a surface of implanted \*\*\*silicon\*\*\* by nanosecond laser annealing in the regime of interference of two crossed beams. The two-dimensional \*\*\*grating\*\*\* is formed at the surface of single-crystal \*\*\*silicon\*\*\* by implantation through a special periodic mask. Diffraction \*\*\*gratings\*\*\* formed are amplitude \*\*\*gratings\*\*\* because their periodically alternating fragments differ only in the reflection coefficient. The amplitude \*\*\*gratings\*\*\* were transformed into phase \*\*\*gratings\*\*\* by irradiation by pulses of incoherent light in the regime of local melting. A noticeable increase in the diffraction efficiency is found in this case, which allows these \*\*\*gratings\*\*\* to be used to study the dynamics of various phase transitions induced by high-power incoherent light pulses in implanted \*\*\*silicon\*\*\*.

CC A6842 Surface phase transitions and critical phenomena; A4280F Gratings, echelles; A6170T Doping and implantation of impurities; A6180B Ultraviolet, visible and infrared radiation effects; A6470D Solid-liquid transitions; A7920D Laser-surface impact phenomena

CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; LASER BEAM ANNEALING; MELTING; \*\*\*SILICON\*\*\* ; SURFACE PHASE TRANSFORMATIONS

ST periodic diffraction structure formation; semiconductor surfaces;  
photoinduced phase transition dynamics; \*\*\*Si surfaces\*\*\* ; \*\*\*1D\*\*\*  
\*\*\* grating\*\*\* ; \*\*\*implanted Si\*\*\* ; nanosecond laser annealing; crossed  
beam interference; \*\*\*2D grating\*\*\* ; \*\*\*single-crystal Si\*\*\* ;  
periodic mask; implantation; \*\*\*diffraction gratings\*\*\* ;  
\*\*\*amplitude gratings\*\*\* ; periodically alternating fragments; reflection  
coefficient; \*\*\*phase gratings\*\*\* ; incoherent light pulse irradiation;  
local melting; diffraction efficiency; high-power incoherent light pulses;  
\*\*\*Si\*\*\*

CHI Si sur, Si el  
ET Si;\_D

L7 ANSWER 128 OF 187 INSPEC (C) 2006 IEE on STN  
AN 2000:6632772 INSPEC DN A2000-15-6855-090; B2000-08-0520F-054  
TI Erbium incorporation in plasma-deposited amorphous \*\*\*silicon\*\*\*  
AU Terukov, E.I.; Konkov, O.I.; Kudoyarova, V.Kh. (A.F. Ioffe Physicotech.  
Inst., Acad. of Sci., St. Petersburg, Russia); Koughia, K.V.; Weiser, G.;  
Kuhne, H.; Kleider, J.P.; Longeaud, C.; Bruggemann, R.  
SO Journal of Non-Crystalline Solids (May 2000) vol.266-269, p.614-18. 13  
refs.  
Doc. No.: S0022-3093(99)00949-7  
Published by: Elsevier  
Price: CCCC 0022-3093/2000/\$20.00  
CODEN: JNCSEJ ISSN: 0022-3093  
SICI: 0022-3093(200005)266/269L:614:EIPD;1-D  
Conference: Amorphous and Microcrystalline Semiconductors - Science and  
Technology. Eighteenth International Conference. Snowbird, UT, USA, 23-27  
Aug 1999

Sponsor(s): Energy Conversion Devices; Japan Steelworks; MVSyst.; Nat.  
Renewable Energy Lab.; et al

DT Conference Article; Journal

TC Experimental

CY Netherlands

LA English

AB Erbium doped amorphous \*\*\*silicon\*\*\* has been prepared by the  
evaporation of Er containing metallo-organics inside the plasma of a  
plasma enhanced chemical vapor deposition (PECVD) system. The samples  
combine photoluminescence efficiency and photosensitivity at room  
temperature. The spatial distribution of Er was found to be inhomogeneous  
due to insufficient control of the Er source. Electron and hole transport  
properties as well as defect properties were measured by means of  
steady-state photocurrent, constant photocurrent method (CPM), modulated  
photocurrent (MPC) and steady-state photocarrier \*\*\*grating\*\*\* (SSPG)  
experiments, which are interpreted on the basis of the inhomogeneous  
distribution of Er over the film thickness.

CC A6855 Thin film growth, structure, and epitaxy; A7155J Localization in  
disordered structures; A7155E Impurity and defect levels in elemental  
semiconductors; A7280C Electrical conductivity of elemental  
semiconductors; A7360J Electrical properties of elemental semiconductors  
(thin films/low-dimensional structures); A7855C Photoluminescence in  
elemental semiconductors; A7865H Optical properties of elemental  
semiconductors (thin films/low-dimensional structures); A7280N Electrical  
conductivity of amorphous and glassy semiconductors; A7360N Electrical  
properties of amorphous and glassy semiconductors (thin  
films/low-dimensional structures); A7865M Optical properties of amorphous  
and glassy semiconductors and insulators (thin films/low-dimensional  
structures); A5275R Plasma applications in manufacturing and materials  
processing; A8115H Chemical vapour deposition; A6170W Impurity  
concentration, distribution, and gradients; A7240 Photoconduction and  
photovoltaic effects; photodielectric effects; A6180J Ion beam effects;  
A6170T Doping and implantation of impurities; A7220F Low-field transport  
and mobility; piezoresistance (semiconductors/insulators); B0520F Chemical  
vapour deposition; B2520C Elemental semiconductors; B2520F Amorphous and  
glassy semiconductors; B4210 Photoconducting materials and properties;  
B2550B Semiconductor doping

CT AMORPHOUS SEMICONDUCTORS; CARRIER MOBILITY; DEFECT STATES; ELEMENTAL  
SEMICONDUCTORS; ERBIUM; HOLE MOBILITY; HYDROGEN; IMPURITY DISTRIBUTION;  
IMPURITY STATES; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; PHOTOCONDUCTIVITY;  
PLASMA CVD; SEMICONDUCTOR GROWTH; \*\*\*SILICON\*\*\*

ST Er incorporation; \*\*\*amorphous Si\*\*\* ; plasma enhanced chemical vapor  
deposition; PECVD; photoluminescence efficiency; photosensitivity; room  
temperature; spatial distribution; electron transport; hole transport;



defect properties; steady-state photocurrent; constant photocurrent method; modulated photocurrent; \*\*\*steady-state photocarrier grating\*\*\* ; inhomogeneous distribution; \*\*\*a-Si:H,Er\*\*\* ; 293 K; \*\*\*Si:H,Er\*\*\*

CHI Si:H,Er ss, Er ss, Si ss, H ss, Er el, Si el, H el, Er dop, H dop  
 PHP temperature 2.93E+02 K  
 ET Er; Si; H\*Si; Si:H; H doping; doped materials

L7 ANSWER 129 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 2000:6609018 INSPEC DN A2000-13-4280K-009; B2000-07-4150-018  
 TI New optical modulator at 1.3  $\mu$ m integrated on \*\*\*silicon\*\*\*  
 -on-insulator (SIMOX) standard substrate.  
 AU Pascal, D.; Landru, N.; Laval, S.; Koster, A. (Inst. d'Electron.  
 Fondamentale, Univ. de Paris-Sud, Orsay, France)  
 SO 25th European Conference on Optical Communication. ECOC '99 Conference  
 Paris, France: Soc. Electr. Electron, 1999. p.242-3 vol.1 of 2  
 vol.(xxxiii+463+322+65 suppl) pp. 5 refs. Also available on CD-ROM in PDF  
 format  
 Conference: Nice, France, 26-30 Sept 1999  
 Sponsor(s): Minstr. Educ. Nat.; Minstr. Econ. Finances et de Ind  
 ISBN: 2-912328-12-8  
 DT Conference Article  
 TC Practical; Experimental  
 CY France  
 LA English  
 AB A new type of integrated optical modulator based on a ring resonator on  
 \*\*\*SOI\*\*\* substrate is presented. The main features of the observed  
 intensity modulation obtained by carrier injection in \*\*\*silicon\*\*\*  
 are reported. We report a new type of all- \*\*\*silicon\*\*\* optical  
 modulator based on carrier injection in a ring resonator. The geometry  
 allows a small area of the active component. Light injection is realized  
 through \*\*\*grating\*\*\* \*\*\*couplers\*\*\* compatible with optical  
 fiber. Matrices of such modulators have been realized and could be used as  
 a spatial light modulator connecting a fiber bundle to another one.

CC A4280K Optical beam modulators; A4282 Integrated optics; A6170T Doping and  
 implantation of impurities; B4150 Electro-optical devices; B4140  
 Integrated optics; B2550B Semiconductor doping  
 CT ELECTRO-OPTICAL MODULATION; INTEGRATED OPTICS; INTENSITY MODULATION;  
 \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; OPTICAL RESONATORS; \*\*\*SILICON\*\*\* ;  
 SIMOX; SPATIAL LIGHT MODULATORS; SUBSTRATES  
 ST optical modulator; 1.3  $\mu$ m; \*\*\*Si-on-insulator standard substrate\*\*\* ;  
 SIMOX standard substrate; integrated optical modulator; ring resonator;  
 \*\*\*SOI substrate\*\*\* ; intensity modulation; carrier injection;  
 \*\*\*all-silicon optical modulator\*\*\* ; ring resonator geometry; active  
 component; light injection; spatial light modulator; fiber bundle; 1.3  
 $\mu$ m; \*\*\*Si\*\*\*

CHI Si int, Si el  
 PHP wavelength 1.3E-06 m  
 ET Si

L7 ANSWER 130 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1999:6318907 INSPEC DN A1999-18-6842-004  
 TI The dynamics of anisotropic local melting of semiconductors at irradiation  
 by powerful light pulses.  
 AU Fattakhov, Ya.V.; Galyautdinov, M.F.; L'vova, T.N.; Khaibullin, I.B.  
 (Physicotech. Inst., Acad. of Sci., Kazan, Russia)  
 SO Proceedings of the International Conference on LASERS'97  
 Editor(s): Carroll, J.J.; Goldman, T.A.  
 Mclean, VA, USA: Soc. Opt. & Quantum Electron, 1998. p.440-5 of xv+1008  
 pp. 4 refs.  
 Conference: New Orleans, LA, USA, 15-19 Dec 1997  
 DT Conference Article  
 TC Experimental  
 CY United States  
 LA English  
 AB The dynamics of anisotropic local melting of monocrystalline and implanted  
 \*\*\*silicon\*\*\* at different regimes of light pulse irradiation was  
 investigated using several optical methods. In particular, the special  
 diffraction \*\*\*gratings\*\*\* were formed on the \*\*\*silicon\*\*\*  
 surface using \*\*\*ion\*\*\* \*\*\*implantation\*\*\* and the effect of local  
 melting. The diffraction picture was observed at illumination of such  
 \*\*\*grating\*\*\* by continual irradiation of a He-Ne laser. The intensity  
 of the diffraction picture depends on the contrast of this periodical

structure, i.e. from difference of crystalline and phase conditions of the substance of \*\*\*gratings\*\*\* fragments. The dynamics of the diffraction effectivity during and after the power light pulse was registered using a high-speed camera or a photomultiplier. It is possible to note three qualitative stages. In the first stage the decrease of diffraction effectivity and its full disappearance takes place as heating of the sample with the diffraction \*\*\*grating\*\*\*. This means that the recrystallization of the amorphous layer is finished. In the second stage the diffraction picture arises again when the temperature of the sample with the \*\*\*grating\*\*\* reaches the temperature of local melting. In this case the local melting begins on "amorphized" cells of the diffraction \*\*\*grating\*\*\*. In the third stage the small decrease of diffraction effectivity was observed after switching off the light pulse, cooling of the sample and recrystallization of local molten regions. Thus it is possible to determine from this experiment the parameters which are necessary to develop the physical model of the effect and to understand the features of phase transitions during light irradiation.

CC A6842 Surface phase transitions and critical phenomena; A6470D Solid-liquid transitions; A4280F Gratings, echelles; A4260H Laser beam characteristics and interactions; A7920D Laser-surface impact phenomena; A6180B Ultraviolet, visible and infrared radiation effects; A6170T Doping and implantation of impurities

CT DIFFRACTION \*\*\*GRATINGS\*\*\*; ELEMENTAL SEMICONDUCTORS; HEATING; \*\*\*ION\*\*\*; \*\*\*IMPLANTATION\*\*\*; LASER BEAM EFFECTS; MELTING; RECRYSTALLISATION; SEMICONDUCTOR DOPING; \*\*\*SILICON\*\*\*; SURFACE PHASE TRANSFORMATIONS

ST anisotropic local melting; semiconductors; powerful light pulses; dynamics; \*\*\*monocrystalline Si\*\*\*; \*\*\*implanted Si\*\*\*; light pulse irradiation; optical methods; \*\*\*diffraction gratings\*\*\*; \*\*\*Si surface\*\*\*; \*\*\*ion implantation\*\*\*; local melting; diffraction picture; illumination; continual irradiation; He-Ne laser; periodical structure; phase conditions; crystalline conditions; \*\*\*gratings\*\*\*

\*\*\* fragments\*\*\*; diffraction effectivity; power light pulse; qualitative stages; heating; recrystallization; amorphous layer; amorphized cells; implanted cell; microrelief; light irradiation; phase transitions; physical model; local molten regions; light pulse; \*\*\*Si\*\*\*; He-Ne

CHI Si sur, Si el; HeNe bin, He bin, Ne bin

ET He\*Ne; He-Ne; Si; HeNe; He cp; cp; Ne cp; He; Ne

L7 ANSWER 131 OF 187 INSPEC (C) 2006 IEE on STN

AN 1999:6201002 INSPEC DN A1999-09-7865K-015

TI Coherent THz emission from optically excited intrasubband plasmons in single quantum wells.

AU Vosseburger, M.; Hering Bolivar, P.; Sekine, N.; Yamanaka, K.; Hirakawa, K.; Kurz, H. (Inst. fur Halbleitertechn. II, Tech. Hochschule Aachen, Germany)

SO Technical Digest. Summaries of Papers Presented at the International Quantum Electronics Conference. Conference Edition. 1998 Technical Digest Series, Vol.7 (IEEE Cat. No.98CH36236)

Washington, DC, USA: Opt. Soc. America, 1998. p.150-1 of 256 pp. 1 refs.

Conference: San Francisco, CA, USA, 3-8 May 1998

Sponsor(s): APS/Div. Lasers Sci.; IEEE/Lasers & Electro-Opt. Soc.; OSA-Opt. Soc. America; US Joint Council on Quantum Electron.; Int. Council on Quantum Electron.; Int. Commission for Opt.; IUPAP

Price: CCCC 1 55752 521 8/98/\$15.00

ISBN: 1-55752-541-2

DT Conference Article

TC Experimental

CY United States

LA English

AB We present the first measurements of optically excited intrasubband plasmons in modulation-doped GaAs single quantum wells. The sample is excited under an incident angle of 45 degrees with 100-fs pulses from a Ti:sapphire laser operating at a photon energy of 1.596 eV. Radiative plasmon modes emit THz pulses via a 3-  $\mu$ m \*\*\*grating\*\*\*

\*\*\*coupler\*\*\* on top of the sample. The emitted THz radiation is collected by two paraboloidal mirrors and detected with an \*\*\*ion\*\*\*

\*\*\*implanted\*\*\* \*\*\*silicon\*\*\* -on-sapphire antenna, which is gated with a time-delayed second part of the laser beam.

CC A7865K Optical properties of III-V and II-VI semiconductors (thin films/low-dimensional structures); A7320D Electron states in low-dimensional structures; A6170T Doping and implantation of impurities;

A7145G Exchange, correlation, dielectric and magnetic functions, plasmons  
 CT CARRIER DENSITY; GALLIUM ARSENIDE; III-V SEMICONDUCTORS; PLASMONS;  
 SEMICONDUCTOR DOPING; SEMICONDUCTOR QUANTUM WELLS; SUBMILLIMETRE WAVE  
 SPECTRA  
 ST coherent THz emission; optically excited intrasubband plasmons; single  
 quantum wells; modulation-doped GaAs single quantum wells; incident angle;  
 Ti:sapphire laser; photon energy; radiative plasmon modes; THz pulses;  
 \*\*\*grating coupler\*\*\* ; emitted THz radiation; paraboloidal mirrors;  
 \*\*\*silicon-on-sapphire antenna\*\*\* ; 100 fs; 1.596 eV; GaAs  
 CHI GaAs int, As int, Ga int, GaAs bin, As bin, Ga bin; Al2O3 ss, Al2 ss, Al  
 ss, O3 ss, Ti ss, O ss, Ti el, Ti dop  
 PHP time 1.0E-13 s; electron volt energy 1.596E+00 eV  
 ET As\*Ga; As sy 2; sy 2; Ga sy 2; GaAs; Ga cp; cp; As cp; Ti; V; As; Ga;  
 Al\*O; Al2O; Al cp; O cp; Al; O  
 L7 ANSWER 132 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1998:6095262 INSPEC DN A9901-6180B-006; B9901-2550A-007  
 TI The dynamics of recrystallization and melting of implanted \*\*\*silicon\*\*\*  
 at irradiation by powerful light pulses.  
 AU Fattakhov, Y.V.; Galyautdinov, M.F.; L'vova, T.N.; Khaibullin, I.B.  
 (Phys.-Tech. Inst., Acad. of Sci., Kazan, Russia)  
 SO Vacuum (Oct. 1998) vol.51, no.2, p.255-9. 10 refs.  
 Doc. No.: S0042-207X(98)00170-5  
 Published by: Elsevier  
 Price: CCCC 0042-207X/98/\$19.00+.00  
 CODEN: VACUAV ISSN: 0042-207X  
 SICI: 0042-207X(199810)51:2L:255:DRMI;1-X  
 Conference: Vacuum, Electron and Ion Technologies. 10th International  
 Summer School VEIT'97. Varna, Bulgaria, 22-26 Sept 1997  
 DT Conference Article; Journal  
 TC Experimental  
 CY United Kingdom  
 LA English  
 AB One of the effects observed in the irradiation of semiconductors by  
 powerful pulses of coherent and incoherent light sources in the range of  
 durations from 0.2 ms to 10 s is the effect of anisotropic local melting.  
 It allows valuable physical information on semiconductor properties and  
 processes occurring in the sample during and after pulse irradiation to be  
 obtained. Here the dynamics of anisotropic local melting of implanted  
 \*\*\*silicon\*\*\* for different regimes of light pulses is investigated. The  
 nucleation and growth of local regions of melting (LRM) during the light  
 irradiation was detected by a high-speed camera. The time dependencies of  
 the quantity and sizes of LRMs were dynamically observed for the first  
 time. Diffraction \*\*\*gratings\*\*\* were formed using \*\*\*ion\*\*\*  
 \*\*\*implantation\*\*\* and the effect of local melting. The dynamics of  
 diffraction during and after the light pulse irradiation were studied. The  
 results allow the specification of the mechanism of the effect of  
 anisotropic local melting, and the optimization of the regimes of pulse  
 annealing of implanted semiconductors and the regimes of formation of  
 submicron dopant layers by rapid thermal diffusion from spin-on sources.  
 CC A6180B Ultraviolet, visible and infrared radiation effects; A6170T Doping  
 and implantation of impurities; A6170A Annealing processes; A6470D  
 Solid-liquid transitions; B2550A Annealing processes in semiconductor  
 technology; B2550B Semiconductor doping; B2520C Elemental semiconductors  
 CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; DIFFUSION; ELEMENTAL SEMICONDUCTORS;  
 INCOHERENT LIGHT ANNEALING; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; MELTING;  
 NUCLEATION; RECRYSTALLISATION; SEMICONDUCTOR DOPING; \*\*\*SILICON\*\*\*  
 ST recrystallization; \*\*\*implanted silicon\*\*\* ; powerful light pulses;  
 incoherent light sources; coherent light sources; anisotropic local  
 melting; semiconductor properties; pulse irradiation; dynamics;  
 nucleation; growth; light irradiation; time dependence; \*\*\*diffraction\*\*\*  
 \*\*\* gratings\*\*\* ; \*\*\*ion implantation\*\*\* ; optimization; pulse annealing;  
 submicron dopant layers; rapid thermal diffusion; spin-on sources;  
 \*\*\*Si\*\*\*  
 CHI Si el  
 ET Si  
 L7 ANSWER 133 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1998:6076751 INSPEC DN A9824-8160C-018; B9812-2550E-110  
 TI Direct micropatterning of \*\*\*Si\*\*\* and GaAs using electrochemical  
 development of focused \*\*\*ion\*\*\* beam \*\*\*implants\*\*\*  
 AU Schmuki, P. (Dept. of Mater. Sci., Fed. Inst. of Technol., Lausanne,

Switzerland); Erickson, L.E.  
SO Applied Physics Letters (2 Nov. 1998) vol.73, no.18, p.2600-2. 15 refs.  
Doc. No.: S0003-6951(98)00244-7  
Published by: AIP  
Price: CCCC 0003-6951/98/73(18)/2600(3)/\$15.00  
CODEN: APPLAB ISSN: 0003-6951  
SICI: 0003-6951(19981102)73:18L:2600:DMGU;1-Z

DT Journal  
TC Practical; Experimental  
CY United States  
LA English

AB Focused \*\*\*ion\*\*\* beam \*\*\*implantation\*\*\* of \*\*\*Si\*\*\* ++ was used to write defined surface damage/implant patterns into n-type GaAs (100) and \*\*\*Si\*\*\* (100) substrates. These implant sites represent initiation sites for dissolution processes when electrochemically polarized in HCl or HF electrolytes, respectively. Selective dissolution within the patterns is achieved if anodic polarization of the n-type material is carried out in the dark at potentials below (cathodic to) the onset of dissolution potential of the unimplanted surface. Uniform etching within the implanted region takes place, when local electropolishing conditions are established. Thus, highly defined etch patterns, e.g., lines, \*\*\*gratings\*\*\*, or pits, can be produced in the submicron range. The depth of the etched patterns corresponds to the implant/damage profile created in the implantation process and etch stop occurs at less reactive crystal planes.

CC A8160C Surface treatment and degradation of semiconductors; A6170T Doping and implantation of impurities; B2550E Surface treatment for semiconductor devices; B2550B Semiconductor doping; B2520D II-VI and III-V semiconductors; B2520C Elemental semiconductors

CT DISSOLVING; ELECTROLYTIC POLISHING; ELEMENTAL SEMICONDUCTORS; ETCHING; FOCUSED ION BEAM TECHNOLOGY; GALLIUM ARSENIDE; III-V SEMICONDUCTORS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\*; \*\*\*SILICON\*\*\*; SUBSTRATES

ST direct micropatterning; electrochemical development; \*\*\*focused ion beam\*\*\*  
\*\*\* implants\*\*\*; defined surface damage; implant patterns; n-type GaAs (100) substrate; \*\*\*Si (100) substrate\*\*\*; initiation sites; dissolution processes; electrochemical polarization; HCl electrolyte; HF electrolyte; selective dissolution; anodic polarization; dissolution potential; uniform etching; local electropolishing conditions; lines; \*\*\*gratings\*\*\*; pits; submicron range; etched pattern depth; etch stop; \*\*\*Si\*\*\*; GaAs

CHI Si sur, Si el; GaAs sur, As sur, Ga sur, GaAs bin, As bin  
ET Si; As\*Ga; As sy 2; sy 2; Ga sy 2; GaAs; Ga cp; cp; As cp; Si++; Si ip 1; ip 1; Cl\*H; HCl; H cp; Cl cp; F\*H; HF; F cp; V; As; Ga

L7 ANSWER 134 OF 187 INSPEC (C) 2006 FIZ KARLSRUHE on STN  
AN 1998:6046247 INSPEC DN B9811-4260D-031  
TI Development and characterization of electronic devices based on single crystalline CoSi2/ \*\*\*Si\*\*\* (100)-heterostructures and sub-micron patterning of CoSi2-layers on \*\*\*silicon\*\*\*.

AU Dolle, M.  
CS Forschungszentrum Julich, Germany  
NR JUL-3446  
SO Oct. 1997. 119 pp. 121 refs. Availability: TIB Hannover,D-30167 Hannover, Germany

DT Report  
TC Experimental  
CY Germany, Federal Republic of  
LA German

AB The fabrication process of a light emitting diode (LED)-array with porous \*\*\*silicon\*\*\* (PS) was investigated. The fundamental idea was to control the electroluminescence (EL) of a continuous PS-layer locally by an array of vertical metal-semiconductor-field-effect-transistors (MESFETs) based on single crystalline \*\*\*Si\*\*\* /CoSi2/ \*\*\*Si\*\*\* (100)-heterostructures. The LED-array consists of two crossed stripe-\*\*\*gratings\*\*\* buried in a \*\*\*silicon\*\*\* substrate with a continuous PS-layer on top. One \*\*\*grating\*\*\* acts as source-, the other one as gate- and the PS-layer as drain-electrode of the transistor. Secondary ion mass spectroscopy and channeling measurements have shown that highly conducting source- \*\*\*gratings\*\*\* in intrinsic \*\*\*silicon\*\*\* substrate can be fabricated by implantation of phosphorous through a SiO2-mask. The gate- \*\*\*grating\*\*\* was fabricated by \*\*\*implantation\*\*\* of cobalt \*\*\*ions\*\*\* through a mask perpendicular to the source-stripe- \*\*\*grating\*\*\* and subsequent annealing (ion beam

synthesis, IBS). The current-voltage characteristic of the source and gate-electrode have proven the compatibility of phosphorous-implantation and IBS of CoSi<sub>2</sub>. The compatibility of IBS with the electrolytic formation of porous \*\*\*silicon\*\*\* was demonstrated by the observed EL of porous \*\*\*silicon\*\*\* on buried CoSi<sub>2</sub>-layers. In addition, a novel patterning method for single crystalline CoSi<sub>2</sub>-layers on \*\*\*silicon\*\*\* based on local oxidation of the silicide was developed and optimized. The local oxidation of thin CoSi<sub>2</sub>-layers was investigated in detail. A strong dependence of the patterning process on the silicide layer thickness as well as on the orientation of the oxidation mask was observed. The new process allows the patterning of 100 nm wide gaps between two metallic contacts by use of standard optical lithography.

CC B4260D Light emitting diodes; B0510D Epitaxial growth; B2550B Semiconductor doping; B2550E Surface treatment for semiconductor devices; B2550G Lithography; B2560S Other field effect devices

CT CAPACITANCE; CHANNELLING; COBALT COMPOUNDS; DOPING PROFILES; ELECTROLUMINESCENCE; ELEMENTAL SEMICONDUCTORS; INTERFACE STRUCTURE; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; LIGHT EMITTING DIODES; MOLECULAR BEAM EPITAXIAL GROWTH; OXIDATION; PHOSPHORUS; PHOTOLITHOGRAPHY; PHOTOLUMINESCENCE; POROUS MATERIALS; RECRYSTALLISATION; RUTHERFORD BACKSCATTERING; SCANNING ELECTRON MICROSCOPY; SCHOTTKY GATE FIELD EFFECT TRANSISTORS; SECONDARY ION MASS SPECTRA; SEMICONDUCTOR DOPING; SEMICONDUCTOR EPITAXIAL LAYERS; SEMICONDUCTOR GROWTH; SEMICONDUCTOR HETEROJUNCTIONS; STOICHIOMETRY; TRANSMISSION ELECTRON MICROSCOPY

ST fabrication process; light emitting diode; \*\*\*porous silicon\*\*\* ; MESFET; metal-semiconductor field effect transistor; heterostructures; \*\*\*crossed stripe-gratings\*\*\* ; secondary ion mass spectroscopy; channeling measurements; implantation; annealing treatment; ion beam synthesis; current-voltage characteristic; gate-electrode; patterning method; local oxidation; layer thickness; standard optical lithography; RBS; Rutherford backscattering; TEM; transmission electron microscopy; SEM; scanning electron microscopy; \*\*\*CoSi<sub>2</sub>-Si\*\*\* ; \*\*\*Si:P\*\*\* ; SiO<sub>2</sub>

CHI CoSi<sub>2</sub>-Si int, CoSi<sub>2</sub> int, Si<sub>2</sub> int, Co int, Si int, CoSi<sub>2</sub> bin, Si<sub>2</sub> bin, Co bin, Si bin, Si el; Si:P bin, Si bin, P bin, Si el, P el, P dop; SiO<sub>2</sub> int, O<sub>2</sub> int, Si int, O int, SiO<sub>2</sub> bin, O<sub>2</sub> bin, Si bin, O bin

ET Co\*Si; Co sy 2; sy 2; Si sy 2; CoSi<sub>2</sub>; Co cp; cp; Si cp; Si; O\*Si; SiO<sub>2</sub>; O cp; CoSi<sub>2</sub>-Si; P\*Si; Si:P; P doping; doped materials; CoSi; Co; P; SiO; O

L7 ANSWER 135 OF 187 INSPEC (C) 2006 IEE on STN

AN 1997:5732719 INSPEC DN A9723-0785-016

TI Spectral characteristics of multilayer cobalt-carbon mirrors for the lambda approximately=7.5 nm range.

AU Kolachevskii, N.N. (P.N. Lebedev Phys. Inst., Acad. of Sci., Moscow, Russia); Louis, E.; Spiller, E.; Mitropol'skii, M.M.; Bijkerk, F.; Ragozin, E.N.

SO Quantum Electronics (Aug. 1997) vol.27, no.8, p.712-16. 23 refs. Published by: Turpion Ltd.; Kvantovaya Elektronika CODEN: QUELEZ ISSN: 1063-7818 SICI (Trl): 1063-7818(199708)27:8L:712:SCMC;1-Z Translation of: Kvantovaya Elektronika, Moskva (Aug. 1997) vol.24, no.8, p.731-5. 23 refs. CODEN: KVEKA3 ISSN: 0368-7147 SICI: 0368-7147(199708)24:8L:731;1-7

DT Journal; Translation Abstracted

TC Experimental

CY Russian Federation; United Kingdom

LA English

AB Multilayer cobalt-carbon mirrors on \*\*\*Si\*\*\* (111) substrates were made by electron-beam deposition and polishing of the metal layers by Kr+ \*\*\*ion\*\*\* \*\*\*bombardment\*\*\* . A new spectroscopic method was developed for estimating the parameters of plane multilayer X-ray mirrors by illuminating a sample with broad-band radiation from a laser-plasma source and by subsequent dispersion of this radiation with a diffraction \*\*\*grating\*\*\* operating in the transmission mode.

CC A0785 X-ray, gamma-ray instruments and techniques; A4280F Gratings, echelles; A4278C Optical lens and mirror design; A4285D Optical fabrication, surface grinding; A8160 Corrosion, oxidation, etching, and other surface treatments; A8115G Vacuum deposition; A6855 Thin film growth, structure, and epitaxy

CT CARBON; COBALT; DIFFRACTION \*\*\*GRATINGS\*\*\* ; ELECTRON BEAM DEPOSITION; LASER MIRRORS; MIRRORS; OPTICAL FABRICATION; OPTICAL FILMS; POLISHING;

X-RAY APPARATUS; X-RAY OPTICS  
ST multilayer mirrors; \*\*\*Si (111) substrates\*\*\* ; Co-C mirrors; \*\*\*Kr+\*\*\*  
\*\*\* ion bombardment\*\*\* ; polishing; metal layers; electron-beam deposition;  
spectroscopic method; plane multilayer X-ray mirrors; broad-band  
radiation; laser-plasma source; dispersion radiation; \*\*\*diffraction\*\*\*  
\*\*\* grating\*\*\* ; transmission mode; spectral characteristics; 7.5 nm;  
\*\*\*Si\*\*\* ; Kr; Co-C  
CHI Si int, Si el; Kr el; Co-C int, Co int, C int, Co el, C el  
PHP wavelength 7.5E-09 m  
ET Si; Kr; Kr+; Kr ip 1; ip 1; C\*Co; Co-C; Co

L7 ANSWER 136 OF 187 INSPEC (C) 2006 IEE on STN  
AN 1997:5673864 INSPEC DN A9719-4282-010; B9710-6260-056;  
C9710-7410F-043  
TI Design and numerical analysis of a "silica-on- \*\*\*silicon\*\*\* "  
integrated optical duplexer.  
AU Forastiere, M.A.; Righini, G.C.; Verciani, A. (Ist. di Ricerca sulle Onde  
Elettromagnetiche, CNR, Firenze, Italy)  
SO Proceedings of the SPIE - The International Society for Optical  
Engineering (1996) vol.2954, p.88-98. 12 refs.  
Published by: SPIE-Int. Soc. Opt. Eng  
Price: CCCC 0 8194 2358 0/96/\$6.00  
CODEN: PSISDG ISSN: 0277-786X  
SICI: 0277-786X(1996)2954L:88:DNAT;1-T  
Conference: Fiber Integrated Optics. Berlin, Germany, 10-11 Oct 1996  
Sponsor(s): SPIE; Technol. Innovationszentrum; Soc. Imaging Sci. &  
Technol.; et al  
DT Conference Article; Journal  
TC Practical; Theoretical  
CY United States  
LA English  
AB Silica-on- \*\*\*silicon\*\*\* is one of the best materials structures  
currently considered for production of integrated optical devices, in  
particular for telecommunication and signal processing applications.  
Deposition of silica films can be advantageously attained by the sol-gel  
technique, which permits both a great flexibility in the refractive index  
definition and the possibility of \*\*\*doping\*\*\* with rare earth  
\*\*\*ions\*\*\*. In this work, we designed and modeled an integrated optical  
duplexer, intended as a component of a fully-integrated erbium-doped  
optical amplifier, operating in the third telecommunication window. The  
guiding structures are of the strip-loaded type, to be realized by the  
sol-gel technique onto a buffered \*\*\*silicon\*\*\* substrate. Design  
optimization and modeling was carried out by a software package which was  
developed on purpose in MATLAB environment, mainly based on the Effective  
Index Method (EIM). Here we report a general design procedure for the  
above said component, which takes into account industrial production  
requirements as well as device's performance.  
CC A4282 Integrated optics; A4280L Optical waveguides and couplers; A4280S  
Optical communications devices; B6260 Optical links and equipment; B4140  
Integrated optics; B4130 Optical waveguides; C7410F Communications  
computing; C7320 Physics and chemistry computing; C5630 Networking  
equipment  
CT INTEGRATED OPTICS; MULTIPLEXING EQUIPMENT; OPTICAL COMMUNICATION  
EQUIPMENT; OPTICAL DESIGN TECHNIQUES; OPTICAL DIRECTIONAL \*\*\*COUPLERS\*\*\*  
; PHYSICS COMPUTING; \*\*\*SILICON\*\*\* ; \*\*\*SILICON\*\*\* COMPOUNDS;  
SOL-GEL PROCESSING; TELECOMMUNICATION COMPUTING  
ST \*\*\*silica-on-silicon integrated optical duplexer\*\*\* ; optical duplexer  
design; sol-gel technique; fully-integrated ER-doped optical amplifier;  
third telecommunication window; strip-loaded type; buffered substrate;  
design optimization; modeling; software package; effective index method;  
industrial production requirements; device performance; \*\*\*directional\*\*\*  
\*\*\* coupler\*\*\* ; transfer loss; beam propagation method; \*\*\*SiO2-Si\*\*\*  
CHI SiO2-Si int, SiO2 int, O2 int, Si int, O int, SiO2 bin, O2 bin, Si bin, O  
bin, Si el  
ET O\*Si; O sy 2; sy 2; Si sy 2; SiO2; Si cp; cp; O cp; SiO2-Si; SiO; Si; O

L7 ANSWER 137 OF 187 INSPEC (C) 2006 IEE on STN  
AN 1997:5673840 INSPEC DN A9719-4280L-026; B9710-4130-033  
TI Fabrication of periodically inverted domain structures in LiTaO3 using ion  
inducing method.  
AU Wanghe Cao; Li Lina (Inst. of Phys., Acad. Sinica, Changchun, China)  
SO Proceedings of the SPIE - The International Society for Optical

Engineering (1996) vol.2897, p.354-6. 4 refs.  
Published by: SPIE-Int. Soc. Opt. Eng  
Price: CCCC 0 8194 2298 3/96/\$6.00  
CODEN: PSISDG ISSN: 0277-786X  
SICI: 0277-786X(1996)2897L.354:FPID;1-D  
Conference: Electro-Optic and Second Harmonic Generation Materials, Devices, and Applications. Beijing, China, 6-7 Nov 1996  
Sponsor(s): SPIE; China Opt. & Optoelectron. Manuf. Assoc.; Chinese Opt. Soc

DT Conference Article; Journal  
TC Experimental  
CY United States  
LA English  
AB The experiment indicated that \*\*\*Si\*\*\* ions have an action of suppressing the widthwise diffusion of protons and increasing the depth during the selective proton exchange process of LiTaO3. It is also suggested that \*\*\*Si\*\*\* ions may induce the domain inversion.

CC A4280L Optical waveguides and couplers; A8230H Chemical exchanges (substitution, atom transfer, abstraction, disproportionation, and group exchange); A4285D Optical fabrication, surface grinding; A6170T Doping and implantation of impurities; A4280F Gratings, echelles; A4265K Optical harmonic generation, frequency conversion, parametric oscillation and amplification; A7780D Ferroelectric domain structure and effects; hysteresis; A4270F Other optical materials; A6630J Diffusion, migration, and displacement of impurities in solids; B4130 Optical waveguides; B4340 Nonlinear optics and devices; B4110 Optical materials

CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; DIFFUSION; ELECTRIC DOMAINS; HEAT TREATMENT; ION EXCHANGE; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; LITHIUM COMPOUNDS; OPTICAL FABRICATION; OPTICAL HARMONIC GENERATION; OPTICAL MATERIALS; OPTICAL WAVEGUIDES

ST periodically inverted domain structures; LiTaO3; ion inducing method; \*\*\*Si ions\*\*\* ; widthwise diffusion; selective proton exchange process; domain inversion; fabrication

CHI LiTaO3 ss, TaO3 ss, Li ss, O3 ss, Ta ss, O ss  
ET Li\*O-Ta; Li sy 3; sy 3; O sy 3; Ta sy 3; LiTaO3; Li cp; cp; Ta cp; O cp; Si; LiTaO; O-Ta; TaO; Li; O; Ta

L7 ANSWER 138 OF 187 INSPEC (C) 2006 IEE on STN  
AN 1996:5480274 INSPEC DN A9705-4281-004; B9703-4125-007  
TI A Kramers-Kronig analysis of the absorption change in fiber \*\*\*gratings\*\*\* .

AU Digonnet, M.J.F. (Edward L. Ginzton Lab., Stanford Univ., CA, USA)  
SO Proceedings of the SPIE - The International Society for Optical Engineering (1996) vol.2841, p.109-20. 28 refs.  
Published by: SPIE-Int. Soc. Opt. Eng  
Price: CCCC 0 8194 2229 0/96/\$6.00  
CODEN: PSISDG ISSN: 0277-786X  
SICI: 0277-786X(1996)2841L.109:KKAA;1-A  
Conference: Doped Fiber Devices. Denver, CO, USA, 8-9 Aug 1996  
Sponsor(s): SPIE

DT Conference Article; Journal  
TC Experimental  
CY United States  
LA English  
AB We apply a Kramers-Kronig model to several published experimental studies of photosensitivity in Ge-doped silica to calculate the predicted index change Delta nKK from the measured change in the absorption spectrum (induced by UV, flame brushing and \*\*\*ion\*\*\* \*\*\*implantation\*\*\* ). In most cases Delta nKK is close to the measured index change Delta nexp. Most of Delta nKK ( 50%-95%) arises from absorption changes between 165 and 195 nm. In the few cases where Delta nKK is much smaller than Delta nexp, the absorption spectrum was not measured below 200 nm, which is probably the reason for the discrepancy. Based on several observations, we also make the hypothesis that in the majority of our study population, color centers are probably responsible for most of the observed absorption change, and thus of the index change.

CC A4281D Optical propagation, dispersion and attenuation in fibres; A4280F Gratings, echelles; A6170D Colour centres; A7850E Impurity and defect absorption in insulators; A7820D Optical constants and parameters; A6170T Doping and implantation of impurities; B4125 Fibre optics

CT COLOUR CENTRES; DEFECT ABSORPTION SPECTRA; DIFFRACTION \*\*\*GRATINGS\*\*\* ; GERMANIUM; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; KRAMERS-KRONIG RELATIONS;

LIGHT ABSORPTION; OPTICAL FIBRES; REFRACTIVE INDEX; \*\*\*SILICON\*\*\*  
 COMPOUNDS

ST Kramers-Kronig analysis; absorption change; \*\*\*fiber gratings\*\*\* ;  
 Kramers-Kronig model; photosensitivity; Ge-doped SiO<sub>2</sub>; predicted index  
 change; absorption spectrum; \*\*\*ion implantation\*\*\* ; flame brushing;  
 color centers; ultraviolet photons; 165 to 195 nm; SiO<sub>2</sub>:Ge

CHI SiO<sub>2</sub>:Ge ss, SiO<sub>2</sub> ss, Ge ss, O<sub>2</sub> ss, Si ss, O ss, SiO<sub>2</sub> bin, O<sub>2</sub> bin, Si bin,  
 O bin, Ge el, Ge dop

PHP wavelength 1.65E-07 to 1.95E-07 m

ET Ge; O\*Si; SiO<sub>2</sub>; Si cp; cp; O cp; Ge\*O\*Si; Ge sy 3; sy 3; O sy 3; Si sy 3;  
 SiO<sub>2</sub>:Ge; Ge doping; doped materials; SiO; O; Si

L7 ANSWER 139 OF 187 INSPEC (C) 2006 IEE on STN

AN 1996:5433568 INSPEC DN A9701-4280F-005

TI Atomic force microscopy of laser induced sub-micrometer periodic  
 structures on implanted fused silica and \*\*\*silicon\*\*\* .

AU Bukharaev, A.A.; Janduganov, V.M.; Samarsky, E.A.; Berdunov, N.V.  
 (Physicotech. Inst., Acad. of Sci., Kazan, Russia)

SO Applied Surface Science (Sept. 1996) vol.103, no.1, p.49-54. 10 refs.  
 Published by: Elsevier  
 Price: CCCC 0169-4332/96/\$15.00  
 CODEN: ASUSEE ISSN: 0169-4332  
 SICI: 0169-4332(199609)103:1L:49:AFML;1-5

DT Journal

TC Experimental

CY Netherlands

LA English

AB The ultrathin layers with depth from 30 to 60 nm and optical absorption  
 coefficient up to 105 cm<sup>-1</sup> were created on the fused silica and  
 crystalline \*\*\*silicon\*\*\* surfaces by Fe and Sb \*\*\*ions\*\*\*  
 \*\*\*bombardment\*\*\* respectively. Nanometer-scale alpha -Fe particles  
 formed into glass surface layer by high dose Fe+ bombardment were  
 responsible for optical absorption in the Fe+ implanted fused silica. The  
 increase in the optical absorption of \*\*\*Si\*\*\* after Sb+ implantation  
 are due to transformation of the \*\*\*silicon\*\*\* surface layer from the  
 crystalline to the amorphous state. These layers were found to be easily  
 evaporated by pulsed beam of UV and visible lasers due to their high light  
 absorption. Such materials may be promising in manufacturing the video  
 disk master. The sub-micrometer diffraction \*\*\*gratings\*\*\* were  
 produced using holographic method in order to estimate the possible  
 resolution of these media for optical data storage. It was found with  
 Atomic Force Microscope (AFM) that microtopography of laser-induced  
 diffraction \*\*\*gratings\*\*\* is determined by the size of optical  
 absorption centers. After treatment with higher laser power density the  
 half-micrometer bi-directional diffraction \*\*\*gratings\*\*\* on implanted  
 \*\*\*silicon\*\*\* were observed by AFM. The origin of these \*\*\*gratings\*\*\*  
 was explained in terms of the laser-induced surface electromagnetic waves.

CC A4280F Gratings, echelles; A6180J Ion beam effects; A6170T Doping and  
 implantation of impurities; A6820 Solid surface structure; A7820D Optical  
 constants and parameters; A4240E Holographic optical elements; holographic  
 gratings

CT ABSORPTION COEFFICIENTS; ATOMIC FORCE MICROSCOPY; ELEMENTAL  
 SEMICONDUCTORS; HOLOGRAPHIC \*\*\*GRATINGS\*\*\* ; \*\*\*ION\*\*\*  
 \*\*\*IMPLANTATION\*\*\* ; LASER BEAM EFFECTS; \*\*\*SILICON\*\*\* ;  
 \*\*\*SILICON\*\*\* COMPOUNDS

ST fused silica; \*\*\*crystalline silicon surfaces\*\*\* ; laser induced sub-  
 mu m periodic structures; atomic force microscopy; ultrathin layers;  
 optical absorption coefficient; \*\*\*ion bombardment\*\*\* ; glass surface  
 layer; amorphisation; visible lasers; UV lasers; \*\*\*diffraction\*\*\*  
 \*\*\*gratings\*\*\* ; optical data storage; microtopography; \*\*\*Si\*\*\* ; SiO<sub>2</sub>

CHI Si sur, Si el; SiO<sub>2</sub> sur, O<sub>2</sub> sur, Si sur, O sur, SiO<sub>2</sub> bin, O<sub>2</sub> bin, Si bin,  
 O bin

ET Fe; Sb; Fe+; Fe ip 1; ip 1; Si; Sb+; Sb ip 1; O\*Si; SiO<sub>2</sub>; Si cp; cp; O cp;  
 SiO; O

L7 ANSWER 140 OF 187 INSPEC (C) 2006 FIZ KARLSRUHE on STN

AN 1996:5420976 INSPEC DN A9624-4280S-017; B9612-6260-116

TI From processing of cosmic ices to optical communications.

AU Brown, W.L. (AT&T Bell Labs., Murray Hill, NJ, USA)

SO Nuclear Instruments & Methods in Physics Research, Section B (Beam  
 Interactions with Materials and Atoms) (Aug. 1996) vol.116, no.1-4,  
 p.1-12. 17 refs.



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Conference: 8th Conference on Radiation Effects in Insulators. Catania,  
Italy, 11-15 Sept 1995  
Sponsor(s): Univ. Catania; Consorzio Catania Ric.; Consiglio Nat. Ric.; et  
al

DT Conference Article; Journal  
TC Experimental; General Review  
CY Netherlands  
LA English

AB In the low temperatures of space, frozen layers of water, ammonia and  
methane are subject to chemical and physical alteration by  
\*\*\*bombardment\*\*\* with energetic \*\*\*ions\*\*\*, electrons and photons.  
In the lithographic definition of submicron \*\*\*silicon\*\*\* integrated  
circuits, the optical elements of the lithographic system are damaged by  
light at high intensities. In glass fiber communication systems optical  
\*\*\*grating\*\*\* for wavelength selectivity can be formed by UV  
irradiation. This small subset of radiation effects in insulators is  
discussed as illustrative of the range of influence of this field in  
current science and technology.

CC A4280S Optical communications devices; A9650D Interplanetary dust; A4281B  
Optical fibre fabrication, cladding, splicing, joining; B6260 Optical  
links and equipment; B2550G Lithography; B2570 Semiconductor integrated  
circuits; B4125 Fibre optics

CT COSMIC DUST; COSMIC RAY INTERACTIONS; ELECTRON BEAM EFFECTS; ENERGY LOSS  
OF PARTICLES; INSULATING MATERIALS; INTEGRATED CIRCUIT TECHNOLOGY;  
INTERPLANETARY MATTER; ION BEAM EFFECTS; OPTICAL FIBRE COMMUNICATION;  
OPTICAL FIBRE FABRICATION; ORGANIC COMPOUNDS; PHOTOLITHOGRAPHY; PHOTON  
STIMULATED DESORPTION; RAMAN SPECTRA

ST cosmic ices; optical communication; ammonia; methane; energetic ion  
irradiation; electron irradiation; photon irradiation; optical elements;  
lithographic system; glass fiber communication systems; \*\*\*optical\*\*\*  
\*\*\*grating\*\*\*; wavelength selectivity; radiation effects; illustrative  
examples

ET In

L7 ANSWER 141 OF 187 INSPEC (C) 2006 IEE on STN  
AN 1996:5360697 INSPEC DN A9619-8115H-036; B9610-0520F-045  
TI Improved a-Si1-xGex:H of large x deposited by PECVD.  
AU Wickboldt, P.; Dawen Pang; Paul, W. (Div. of Appl. Sci., Harvard Univ.,  
Cambridge, MA, USA); Chen, J.H.; Fan Zhong; Cohen, J.D.; Yan Chen;  
Williamson, D.L.  
SO Journal of Non-Crystalline Solids (May 1996) vol.198-200, pt.1, p.567-71.  
16 refs.

Published by: Elsevier  
Price: CCCC 0022-3093/96/\$15.00  
CODEN: JNCSEB ISSN: 0022-3093  
SICI: 0022-3093(199605)198/200:1L:567:IXLD;1-4  
Conference: 16th International Conference on Amorphous Semiconductors -  
Science and Technology. Kobe, Japan, 4-8 Sept 1995  
Sponsor(s): IUPAP; Japan Soc. Appl. Phys.; Kobe City; et al

DT Conference Article; Journal  
TC Experimental  
CY Netherlands  
LA English

AB By plasma enhanced chemical vapor deposition a-Si1-xGex:H thin films of  
large x have been prepared which possess optical, electrical and  
structural properties that are greatly improved over any yet reported.  
This work extends our previous work on improving the properties of a-Ge:H  
[W.A. Turner et al., J. Appl. Phys. 67 (1990) 7430]. Steady-state  
photoconductivity measurements yield a  $\eta \mu \tau$  of  $(1 \text{ to } 3) \times 10^{-7} \text{ cm}^2 \text{ V}^{-1}$   
for  $1.00 > x > 0.75$  and  $(6 \text{ to } 10) \times 10^{-8} \text{ cm}^2 \text{ V}^{-1}$  for  $0.75 > x > 0.50$ .  
Photocarrier \*\*\*grating\*\*\* measurements yield an ambipolar diffusion  
length much greater than previously obtained for alloys of large x. The  
electronic state defect density, as determined by drive level capacitance  
measurements, decreases from  $5.3 \times 10^{16} \text{ cm}^{-3}$  for  $x=1.00$  to  $6.5 \times 10^{15} \text{ cm}^{-3}$  for  
 $x=0.57$ . The Urbach parameter,  $E_0$ , was found to be  $41 \pm 2 \text{ meV}$  for a-Ge:H  
and  $45 \pm 2 \text{ meV}$  for the alloys. Small angle X-ray scattering measurements  
reveal a structure that is nearly as homogeneous as device quality a-

\*\*\*Si\*\*\* :H. Much of the improvement in electronic and optical properties is associated with the reduction of heterogeneities in the structure. The elimination of columnar structure is attributed to increased \*\*\*ion\*\*\* \*\*\*bombardment\*\*\* during growth and conditions which yield a high electron temperature in the discharge plasma, resulting in favorable discharge chemistry.

CC A8115H Chemical vapour deposition; A6855 Thin film growth, structure, and epitaxy; A7360F Electronic properties of semiconductor thin films; A7280N Conductivity of amorphous and glassy semiconductors; A7240 Photoconduction and photovoltaic effects; photodielectric effects; A7220J Charge carriers: generation, recombination, lifetime, and trapping (semiconductors/insulators); A7155J Localization in disordered structures; B0520F Vapour deposition; B2520F Amorphous and glassy semiconductors; B4210 Photoconducting materials and properties

CT AMORPHOUS SEMICONDUCTORS; CAPACITANCE; CARRIER LIFETIME; DEFECT STATES; GE- \*\*\*SI\*\*\* ALLOYS; HYDROGEN; PHOTOCONDUCTIVITY; PLASMA CVD; SEMICONDUCTOR GROWTH; SEMICONDUCTOR THIN FILMS; X-RAY SCATTERING

ST a-Si<sub>1-x</sub>Gex:H; plasma enhanced chemical vapor deposition; photoconductivity; \*\*\*photocarrier grating measurements\*\*\* ; ambipolar diffusion length; electronic state defect density; drive level capacitance measurements; Urbach parameter; X-ray scattering; heterogeneity reduction; columnar structure; high electron temperature; discharge plasma; discharge chemistry; SiGe:H

CHI SiGe:H ss, Ge ss, Si ss, H ss, SiGe bin, Ge bin, Si bin, H el, H dop

ET Ge\*H\*Si; Ge sy 3; sy 3; H sy 3; Si sy 3; Si<sub>1-x</sub>Gex:H; H doping; doped materials; Si cp; cp; Ge cp; Ge\*H; Ge:H; J; D; H\*Si; Si:H; Ge\*Si; Ge sy 2; sy 2; Si sy 2; Ge-Si; SiGe:H; Ge; Si; SiGe

L7 ANSWER 142 OF 187 INSPEC (C) 2006 IEE on STN

AN 1996:5349290 INSPEC DN A9619-7920F-001; B9610-2520C-002

TI Imagings of picosecond-photoexcited carriers and enhanced Auger recombination rate by transient reflecting \*\*\*grating\*\*\* measurements.

AU Tanaka, T.; Harata, A.; Sawada, T. (Dept. of Appl. Chem., Tokyo Univ., Japan)

SO Japanese Journal of Applied Physics, Part 1 (Regular Papers, Short Notes & Review Papers) (June 1996) vol.35, no.6A, p.3642-7. 20 refs. Published by: Publication Office, Japanese Journal Appl. Phys ISSN: 0021-4922 SICI: 0021-4922(199606)35:6AL:3642:IPPC;1-C

DT Journal

TC Experimental

CY Japan

LA English

AB Photoinduced dynamic processes at a \*\*\*silicon\*\*\* surface were investigated by time-resolved measurements of a transient reflecting \*\*\*grating\*\*\* with 532 nm excitation and detection. The signal caused by photoexcited carriers was separated from signals due to thermal and acoustic effects. The carrier signal was found to be more sensitive to ion induced damage than the thermal and acoustic effect signal. Use of the carrier signal provided an in-plane distribution image of near surface damage induced by helium \*\*\*ion\*\*\* \*\*\*implantation\*\*\* (energy, 200 keV; dose, 1015 atoms/cm<sup>2</sup>). The cause of the contrast formation was found to be the change of Auger recombination rate gamma 3. The obtained gamma 3 for intrinsic \*\*\*silicon\*\*\* was 4.0\*10<sup>-29</sup> cm<sup>6</sup>/s which was two orders of magnitude larger than the bulk value. The results indicated defects near the surface region ( 100 nm) accelerated gamma 3.

CC A7920F Electron-surface impact: Auger emission; A7280C Conductivity of elemental semiconductors; A7920N Atom-, molecule-, and ion-surface impact; A7220J Charge carriers: generation, recombination, lifetime, and trapping (semiconductors/insulators); A6180J Ion beam effects; A7240 Photoconduction and photovoltaic effects; photodielectric effects; A6170T Doping and implantation of impurities; A7847 Ultrafast optical measurements in condensed matter; B2520C Elemental semiconductors

CT AUGER EFFECT; CARRIER LIFETIME; ELEMENTAL SEMICONDUCTORS; ION BEAM EFFECTS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; ION-SURFACE IMPACT; PHOTOCONDUCTIVITY; \*\*\*SILICON\*\*\* ; SURFACE RECOMBINATION; SURFACE STATES; TIME RESOLVED SPECTRA

ST picosecond-photoexcited carriers; enhanced Auger recombination rate; \*\*\*transient reflecting grating measurements\*\*\* ; \*\*\*Si surface\*\*\* ; semiconductor; time-resolved measurements; ion induced damage; carrier signal; near surface damage; \*\*\*Si\*\*\*

CHI Si sur, Si el

ET Si

L7 ANSWER 143 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1996:5190770 INSPEC DN A9606-4285-007  
 TI Fabrication of a variable diffraction efficiency phase mask by multiple  
 dose \*\*\*ion\*\*\* \*\*\*implantation\*\*\* .  
 AU Erickson, L.E.; Champion, H.G. (Inst. for Microstructural Sci., Nat. Res.  
 Council of Canada, Ottawa, Ont., Canada); Albert, J.; Hill, K.O.; Malo,  
 B.; Theriault, S.; Bilodeau, F.; Johnson, D.C.  
 SO Journal of Vacuum Science & Technology B (Microelectronics and Nanometer  
 Structures) (Nov.-Dec. 1995) vol.13, no.6, p.2940-3. 11 refs.  
 Published by: AIP for American Vacuum Soc  
 Price: CCCC 0734-211X/95/13(6)/2940/4/\$6.00  
 CODEN: JVTBD9 ISSN: 0734-211X  
 SICI: 0734-211X(199511/12)13:6L:2940:FVDE;1-0  
 Conference: 29th International Conference on Electron, Ion, and Photon  
 Beam Technology and Nanofabrication. Scottsdale, AZ, USA, 30 May-2 June  
 1995  
 Sponsor(s): American Vacuum Soc.; IEEE; Opt. Soc. America  
 DT Conference Article; Journal  
 TC Experimental  
 CY United States  
 LA English  
 AB Apodized fiber Bragg \*\*\*gratings\*\*\* show reductions in the unwanted  
 sidebands from those of uniform Bragg \*\*\*grating\*\*\* . A phase mask  
 whose diffraction efficiency varied from the center to the ends was  
 fabricated by implanting a \*\*\*grating\*\*\* pattern in a SiO2 substrate  
 with \*\*\*Si\*\*\* ++ and wet etching in diluted HF. The phase mask  
 diffraction efficiency vs ion dose was measured. Using this phase mask,  
 apodized Bragg \*\*\*gratings\*\*\* were photoimprinted into fibers. The  
 sidebands of the apodized fiber \*\*\*gratings\*\*\* were 26 dB below the  
 peak of the central resonance compared to 12 dB for the uniform Bragg  
 \*\*\*grating\*\*\* . The modeled values were 29 and 13.2 dB, respectively.  
 CC A4285D Optical fabrication, surface grinding; A4280F Gratings, echelles;  
 A4281B Optical fibre fabrication, cladding, splicing, joining  
 CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ;  
 OPTICAL FIBRE FABRICATION; PHASE SHIFTING MASKS  
 ST fabrication; phase mask; \*\*\*multiple dose ion implantation\*\*\* ;  
 \*\*\*apodized fiber Bragg grating\*\*\* ; sidebands; SiO2 substrate; wet  
 etching; diffraction efficiency; photoimprinting; HF; \*\*\*SiO2:Si\*\*\*  
 CHI HF bin, F bin, H bin; SiO2:Si sur, SiO2 sur, O2 sur, Si sur, O sur,  
 SiO2:Si bin, SiO2 bin, O2 bin, Si bin, O bin, Si el, Si dop  
 ET O\*Si; SiO2; Si cp; cp; O cp; Si; Si++; Si ip 1; ip 1; F\*H; HF; H cp; F cp;  
 B; O sy 2; sy 2; Si sy 2; SiO2:Si; Si doping; doped materials; SiO; O

L7 ANSWER 144 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1996:5162608 INSPEC DN A9604-7220J-004; B9602-2520C-063  
 TI Investigation of recombination parameters in \*\*\*ion\*\*\*  
 \*\*\*implanted\*\*\* layer-substrate \*\*\*Si\*\*\* structures.  
 AU Gaubas, E.; Jarasiunas, K.; Kaniava, A.; Vaitkus, J. (Inst. of Mater. Sci.  
 & Appl. Res., Vilnius Univ., Lithuania)  
 SO Defect and Impurity Engineered Semiconductors and Devices. Symposium  
 Editor(s): Ashok, S.; Chevallier, J.; Akasaki, I.; Johnson, N.M.; Sopori,  
 B.L.  
 Pittsburgh, PA, USA: Mater. Res. Soc, 1995. p.603-8 of xxi+1054 pp. 4  
 refs.  
 Conference: San Francisco, CA, USA, 17-21 April 1995  
 DT Conference Article  
 TC Experimental  
 CY United States  
 LA English  
 AB \*\*\*Ion\*\*\* \*\*\*implantation\*\*\* is widely used technological process  
 in the fabrication of semiconductor devices, and contactless techniques to  
 monitor the implantation process and material quality are desired. The  
 excitation-probe nondestructive optical techniques for separate  
 determination of recombination parameters and control of low doses of  
 \*\*\*implanted\*\*\* \*\*\*ions\*\*\* in \*\*\*Si\*\*\* are developed in this  
 work. A modified method of infrared as well as microwave absorption is  
 based on variation of excitation depth of the sample. The mathematical  
 model based on the solution of the continuity equation with layer-by-layer  
 varying parameters, such as carrier bulk lifetime tau b and coefficient of  
 ambipolar diffusion D. The asymptotic decay time tau eff is used as an

experimental parameter to characterize recombination processes of material, and is described in the effective depth approximation by analytical solution of this model. To determine recombination parameters of both layer and substrate, simultaneous investigation of  $\tau_{eff}$  reconcilable changes at different excitation depth  $d_{eff}$  is required. The transient \*\*\*grating\*\*\* (TG) technique is based on sinusoidal refractive index modulation at the surface region by illumination with light interference patterns and subsequent light diffraction on this spatial structure. Experimentally, variations of  $d_{eff}$  are performed by changing the excitation light wavelength. Non-monotonicity of the asymptotic recombination time vs. implantation dose was revealed. In the range of doses  $10^{12}$ - $10^{14}$  cm<sup>-2</sup> (for Ar<sup>+</sup>) carrier bulk lifetime decreases with implantation, while at higher dose values the superlinear increase of surface recombination and decrease of diffusion constant take place. The transient \*\*\*grating\*\*\* technique allows one to determine low doses of B<sup>+</sup> and P<sup>+</sup> ions in the range of  $10^{10}$ - $10^{15}$  cm<sup>-2</sup>.

CC A7220J Charge carriers: generation, recombination, lifetime, and trapping (semiconductors/insulators); A7280C Conductivity of elemental semiconductors; A6170T Doping and implantation of impurities; A6180J Ion beam effects; A3320E Infrared molecular spectra; A7830G Infrared and Raman spectra in inorganic crystals; A7870G Microwave and radiofrequency interactions with condensed matter; A7820D Optical constants and parameters; A6630J Diffusion, migration, and displacement of impurities in solids; B2520C Elemental semiconductors; B2550B Semiconductor doping

CT ARGON; CARRIER LIFETIME; CARRIER MOBILITY; DIFFUSION; ELECTRON-HOLE RECOMBINATION; ELEMENTAL SEMICONDUCTORS; INFRARED SPECTRA; \*\*\*ION\*\*\*  
\*\*\*IMPLANTATION\*\*\* ; LIGHT DIFFRACTION; LIGHT INTERFERENCE; MICROWAVE SPECTRA; REFRACTIVE INDEX; SEMICONDUCTOR DOPING; \*\*\*SILICON\*\*\* ;  
SURFACE RECOMBINATION

ST recombination parameters; \*\*\*ion implanted layer-substrate Si\*\*\*  
\*\*\* structures\*\*\* ; excitation-probe nondestructive optical techniques;  
\*\*\*ion implantation\*\*\* ; contactless techniques; material quality; low doses control; infrared absorption; microwave absorption; excitation depth variation; continuity equation; carrier bulk lifetime; ambipolar diffusion; asymptotic decay time; effective depth approximation; analytical solution; \*\*\*transient grating technique\*\*\* ; sinusoidal refractive index modulation; light interference patterns; light diffraction; spatial structure; \*\*\*Si:Ar\*\*\* ; \*\*\*Si\*\*\*

CHI Si:Ar bin, Ar bin, Si bin, Ar el, Si el, Ar dop; Si sur, Si el  
ET Si; D; Ar; Ar<sup>+</sup>; Ar ip 1; ip 1; B; B<sup>+</sup>; B ip 1; P; P<sup>+</sup>; P ip 1; Ar\*Si; Si:Ar; Ar doping; doped materials

L7 ANSWER 145 OF 187 INSPEC (C) 2006 FIZ KARLSRUHE on STN  
AN 1995:5095606 INSPEC DN A9523-6825-009  
TI Transient reflecting \*\*\*grating\*\*\* for sub-surface analysis: GHz ultrasonic and thermal spectroscopies and imaging.  
AU Sawada, T.; Harata, A. (Dept. of Appl. Chem., Tokyo Univ., Japan)  
SO Applied Physics A (Materials Science Processing) (Sept. 1995) vol.61, no.3, p.263-8. 42 refs.  
CODEN: APHYCC ISSN: 0947-8396  
DT Journal  
TC Experimental  
CY Germany, Federal Republic of  
LA English  
AB Picosecond time-resolved Transient Reflecting \*\*\*Grating\*\*\* (TRG) measurements are demonstrated for GHz ultrasonic and thermal spectroscopies of thin films and sub-surface regions of sub- $\mu$ m scale. The measurements should be tools for electrochemical interface monitoring and time-resolved imaging. Some results are presented to show \*\*\*ion\*\*\* - \*\*\*implantation\*\*\* -induced surface hardening and unusual heat-diffusion behavior near a \*\*\*silicon\*\*\* surface. A model describing potential dependence of TRG responses at an electrochemical interface is proposed. An image of photoexcited carrier density is compared with a thermal image for a He- \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* wafer to demonstrate the time-resolved imaging.

CC A6825 Mechanical and acoustical properties of solid surfaces and interfaces; A6550 Thermodynamic properties and entropy; A0760H Optical refractometry and reflectometry; A4385G Measurement by acoustic techniques; A0720D Thermometry; A0762 Detection of radiation (bolometers, photoelectric cells, i.r. and submillimetre waves detection)

CT INFRARED IMAGING; INTERFACE STRUCTURE; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\*  
; PHOTOACOUSTIC SPECTROSCOPY; PHOTOTHERMAL SPECTROSCOPY; SURFACE

HARDENING; SURFACE STRUCTURE; THERMAL DIFFUSIVITY; THIN FILMS; ULTRASONIC IMAGING

ST subsurface analysis; \*\*\*transient reflecting gratings\*\*\* ; GHz ultrasonic spectroscopy; acoustic imaging; thermal spectroscopy; infrared imaging; thin films; electrochemical interface monitoring tool; time resolved imaging; surface hardening monitoring; photoexcited carrier density; \*\*\*He ion implanted Si\*\*\* ; temperature dependence; 100 to 300 K

PHP temperature 1.0E+02 to 3.0E+02 K

ET He; Si

L7 ANSWER 146 OF 187 INSPEC (C) 2006 IEE on STN

AN 1995:5070624 INSPEC DN A9521-4260B-041; B9511-4320J-127

TI Two-longitudinal-mode laser diodes.

AU Iio, S.; Suehiro, M.; Hirata, T. (Optoelectron. Lab., Yokogawa Electr. Corp., Tokyo, Japan); Hidaka, T.

SO IEEE Photonics Technology Letters (Sept. 1995) vol.7, no.9, p.959-61. 9 refs.  
Price: CCCC 1041-1135/95/\$04.00  
CODEN: IPTLEL ISSN: 1041-1135

DT Journal

TC Practical; Experimental

CY United States

LA English

AB Two-longitudinal-mode distributed-Bragg-reflector laser diodes have been fabricated for wavelength-division-multiplexing communication systems, two-wavelength optical measurement systems, and optical data processing systems. A Bragg reflector with a periodic-phase-shift \*\*\*grating\*\*\* is adopted for two-longitudinal-mode operation. Active and passive waveguides are monolithically integrated by compositional disordering of the quantum well using \*\*\*silicon\*\*\* \*\*\*ion\*\*\*  
\*\*\*implantation\*\*\*

CC A4260B Design of specific laser systems; A4255P Lasing action in semiconductors; A4280S Optical communications devices; A4280F Gratings, echelles; A4282 Integrated optics; B4320J Semiconductor lasers; B6260 Optical links and equipment; B4140 Integrated optics

CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; DISTRIBUTED BRAGG REFLECTOR LASERS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; LASER MODES; OPTICAL INFORMATION PROCESSING; OPTICAL TRANSMITTERS; QUANTUM WELL LASERS; WAVEGUIDE LASERS; WAVELENGTH DIVISION MULTIPLEXING

ST two-longitudinal-mode laser diodes; distributed-Bragg-reflector laser diodes; wavelength-division-multiplexing communication systems; two-wavelength optical measurement systems; optical data processing systems; \*\*\*periodic-phase-shift grating\*\*\* ; two-longitudinal-mode operation; passive waveguides; active waveguides; monolithic integration; compositional disordering; \*\*\*Si ion implantation\*\*\* ;  
\*\*\*GaAs-AlGaAs:Si\*\*\*

CHI GaAs-AlGaAs:Si int, AlGaAs:Si int, AlGaAs int, GaAs int, Al int, As int, Ga int, Si int, AlGaAs:Si ss, AlGaAs ss, Al ss, As ss, Ga ss, Si ss, GaAs bin, As bin, Ga bin, Si el, Si dop

ET Si; Al\*As\*Ga\*Si; Al sy 4; sy 4; As sy 4; Ga sy 4; Si sy 4; GaAs; Ga cp; cp; As cp; AlGaAs:Si; Si doping; doped materials; Al cp; GaAs-AlGaAs:Si; Al\*As\*Ga; Al sy 3; sy 3; As sy 3; Ga sy 3; AlGaAs; As\*Ga; As sy 2; sy 2; Ga sy 2; Al; As; Ga

L7 ANSWER 147 OF 187 INSPEC (C) 2006 IEE on STN

AN 1995:5058870 INSPEC DN A9521-4260B-002; B9511-4320J-033

TI GaAs quantum well distributed Bragg reflection laser with AlGaAs/GaAs superlattice \*\*\*gratings\*\*\* fabricated by focused ion beam mixing.

AU Steckl, A.J.; Chen, P. (Dept. of Electr. & Comput. Eng., Cincinnati Univ., OH, USA); Cao, X.; Jackson, H.E.; Kumar, M.; Boyd, J.T.

SO Applied Physics Letters (10 July 1995) vol.67, no.2, p.179-81. 21 refs.  
Price: CCCC 0003-6951/95/67(2)/179/3/\$6.00  
CODEN: APPLAB ISSN: 0003-6951

DT Journal

TC Experimental

CY United States

LA English

AB GaAs quantum well (QW) lasers with distributed Bragg reflection (DBR) Al<sub>0.3</sub>Ga<sub>0.7</sub>As/GaAs supperlattice \*\*\*gratings\*\*\* have been fabricated by the single-step, maskless focused ion beam (FIB) mixing. 200 keV  
\*\*\*Si\*\*\* ++ FIB implantation with a beam diameter of approximately 60-70

nm and a dose of 1014 cm<sup>-2</sup> was used to obtain localized compositional mixing. The DBR \*\*\*grating\*\*\* period was 350 nm, corresponding to a third order \*\*\*grating\*\*\* matched to the emission from the 30 nm wide QW. Lasing operation was examined by optical pumping. With a pumping power 1.6\* the threshold value, lasing modes were observed near 827 nm, with a spacing of 3 AA and a linewidth of 1.5 AA.

CC A4260B Design of specific laser systems; A4280F Gratings, echelles; A6170T Doping and implantation of impurities; A4255P Lasing action in semiconductors; A4285D Optical fabrication, surface grinding; A6180J Ion beam effects; B4320J Semiconductor lasers

CT ALUMINIUM COMPOUNDS; DIFFRACTION \*\*\*GRATINGS\*\*\* ; DISTRIBUTED BRAGG REFLECTOR LASERS; GALLIUM ARSENIDE; III-V SEMICONDUCTORS; ION BEAM MIXING; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; OPTICAL FABRICATION; OPTICAL PUMPING; QUANTUM WELL LASERS; SEMICONDUCTOR DOPING; SEMICONDUCTOR SUPERLATTICES

ST lasing operation; distributed Bragg reflection laser; \*\*\*superlattice\*\*\* \*\*\* gratings\*\*\* ; focused ion beam mixing; Al<sub>0.3</sub>Ga<sub>0.7</sub>As/GaAs; localized compositional mixing; emission; optical pumping; pumping power; threshold value; lasing modes; 200 keV; 827 nm; 60 to 70 nm; 30 nm; AlGaAs-GaAs

CHI AlGaAs-GaAs int, AlGaAs int, GaAs int, Al int, As int, Ga int, AlGaAs ss, Al ss, As ss, Ga ss, GaAs bin, As bin, Ga bin

PHP electron volt energy 2.0E+05 eV; wavelength 8.27E-07 m; size 6.0E-08 to 7.0E-08 m; size 3.0E-08 m

ET As\*Ga; As sy 2; sy 2; Ga sy 2; GaAs; Ga cp; cp; As cp; Al\*As\*Ga; Al sy 3; sy 3; As sy 3; Ga sy 3; AlGaAs; Al cp; Al<sub>0.3</sub>Ga<sub>0.7</sub>As; Si; Si++; Si ip 1; ip 1; V; AlGaAs-GaAs; Al; As; Ga

L7 ANSWER 148 OF 187 INSPEC (C) 2006 IEE on STN

AN 1994:4835416 INSPEC DN A9502-6170T-007; B9501-2550B-027

TI Local Ga \*\*\*implantation\*\*\* with focused \*\*\*ion\*\*\* beam and ambipolar lateral carrier transport in strained Si<sub>1-x</sub>Ge<sub>x</sub>/ \*\*\*Si\*\*\* quantum wells.

AU Okubo, A.; Fukatsu, A.S.; Shiraki, Y. (Res. Center for Adv. Sci. & Technol., Tokyo Univ., Japan)

SO Applied Physics Letters (14 Nov. 1994) vol.65, no.20, p.2582-4. 19 refs. Price: CCCC 0003-6951/94/65(20)/2582/3/\$6.00 CODEN: APPLAB ISSN: 0003-6951

DT Journal

TC Practical

CY United States

LA English

AB Lateral carrier diffusion in a strained Si<sub>1-x</sub>Ge<sub>x</sub>/ \*\*\*Si\*\*\* quantum well (QW) is reported using a periodic two-dimensional \*\*\*grating\*\*\* geometry defined by focused \*\*\*ion\*\*\* beam local-Ga-\*\*\*implantation\*\*\*. With systematically changing the \*\*\*grating\*\*\* period, we observed a clear dominance switch of steady-state photoluminescence (PL) intensity between defect-related luminescence from Ga-implanted \*\*\*grating\*\*\* stripes and PL emanating from the centered QW region. Fitting to a simple diffusion model, the lateral diffusion length was found to extend to several microns at low temperatures, whereas it increases with temperature up to 58 K.

CC A6170T Doping and implantation of impurities; A6170W Impurity concentration, distribution, and gradients; A6180J Ion beam effects; A7340L Semiconductor-to-semiconductor contacts, p-n junctions, and heterojunctions; B2550B Semiconductor doping; B2530C Semiconductor superlattices, quantum wells and related structures; B2520M Other semiconductor materials; B2520C Elemental semiconductors

CT CARRIER MOBILITY; ELEMENTAL SEMICONDUCTORS; GALLIUM; GE- \*\*\*SI\*\*\* ALLOYS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; SEMICONDUCTOR DOPING; SEMICONDUCTOR MATERIALS; SEMICONDUCTOR QUANTUM WELLS; \*\*\*SILICON\*\*\*

ST local Ga implantation; focused ion beam; ambipolar lateral carrier transport; \*\*\*strained Si<sub>1-x</sub>Ge<sub>x</sub>/Si quantum wells\*\*\* ; \*\*\*periodic\*\*\* \*\*\* two-dimensional grating geometry\*\*\* ; steady-state photoluminescence; lateral diffusion length; semiconductor; 58 K; \*\*\*SiGe-Si:Ga\*\*\*

CHI SiGe-Si:Ga int, Si:Ga int, SiGe int, Ga int, Ge int, Si int, Si:Ga bin, SiGe bin, Ga bin, Ge bin, Si bin, Ga el, Si el, Ga dop

PHP temperature 5.8E+01 K

ET Ga; Ge\*Si; Ge sy 2; sy 2; Si sy 2; Si<sub>1-x</sub>Ge<sub>x</sub>; Si cp; cp; Ge cp; Ge-Si; Ga\*Ge\*Si; Ga sy 3; sy 3; Ge sy 3; Si sy 3; SiGe; Ga doping; doped materials; SiGe-Si:Ga; Ga\*Si; Ga sy 2; Si:Ga; Ge; Si

L7 ANSWER 149 OF 187 INSPEC (C) 2006 IEE on STN

AN 1994:4828070 INSPEC DN A9501-6170T-001; B9501-2550B-002

TI Transient reflecting \*\*\*grating\*\*\* study of \*\*\*ion\*\*\* -  
 \*\*\*implanted\*\*\* semiconductors.  
 AU Harata, A.; Nishimura, H.; Shen, Q.; Tanaka, T.; Sawada, T. (Dept. of Ind.  
 Chem., Tokyo Univ., Japan)  
 SO Journal de Physique IV (Colloque) (July 1994) vol.4, no.C7, p.C7/159-62. 9  
 refs.  
 CODEN: JPICEI ISSN: 1155-4339  
 Conference: 8th International Topical Meeting on Photoacoustic and  
 Photothermal Phenomena. Pointe a Pitre, Guadeloupe, 22-25 Jan 1994  
 Sponsor(s): Univ. Pierre et Marie Curie; Univ. Antilles-Guyane; et al  
 DT Conference Article; Journal  
 TC Experimental  
 CY France  
 LA English  
 AB Surface modification of \*\*\*Si\*\*\* (100) wafers induced by argon-  
 \*\*\*ion\*\*\* \*\*\*implantation\*\*\* ( \*\*\*ion\*\*\* energy, 300 keV; dose,  
 1011-1017 atoms/cm2) was investigated using a transient reflecting  
 \*\*\*grating\*\*\* technique. Effects of the implantation on velocity,  
 intensity and onset time of surface acoustic waves (SAW) were discussed  
 accompanying the acoustic anisotropy. SAW velocity dispersion was also  
 examined for one of the lightly \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* sample  
 (dose, 1011 atoms/cm2).  
 CC A6170T Doping and implantation of impurities; A6180J Ion beam effects;  
 A6170W Impurity concentration, distribution, and gradients; A6590 Other  
 topics in thermal properties of condensed matter; A7280C Conductivity of  
 elemental semiconductors; A6825 Mechanical and acoustical properties of  
 solid surfaces and interfaces; B2550B Semiconductor doping; B2520C  
 Elemental semiconductors  
 CT ARGON; ELEMENTAL SEMICONDUCTORS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ;  
 PHOTOTHERMAL EFFECTS; SEMICONDUCTOR DOPING; \*\*\*SILICON\*\*\* ; SURFACE  
 ACOUSTIC WAVES  
 ST \*\*\*ion-implanted semiconductors\*\*\* ; surface modification;  
 \*\*\*transient reflecting grating technique\*\*\* ; surface acoustic waves;  
 acoustic anisotropy; SAW velocity dispersion; \*\*\*Si(100) wafers\*\*\* ;  
 \*\*\*Si:Ar\*\*\*  
 CHI Si:Ar sur, Ar sur, Si sur, Si:Ar bin, Ar bin, Si bin, Ar el, Si el, Ar dop  
 ET Si; Ar\*Si; Si:Ar; Ar doping; doped materials; Ar  
 L7 ANSWER 150 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1994:4710161 INSPEC DN A9416-4280F-006  
 TI Nonlinear multimode theory of generation of surface defect-deformation  
 structures under the action of high-power laser radiation.  
 AU Emel'yanov, V.I.; Shlykov, Yu.G. (Lomonosov (M.V.) State Univ., Moscow,  
 Russia)  
 SO Bulletin of the Russian Academy of Sciences. Physics (1993) vol.57, no.12,  
 p.2070-89. 31 refs.  
 Price: CCCC 1062-8738/93/\$50.00  
 ISSN: 1062-8738  
 Translation of: Izvestiya Rossiiskoi Akademii Nauk. Seriya Fizicheskaya  
 (1993) vol.57, no.12, p.18-38. 31 refs.  
 ISSN: 0367-6765  
 Conference: National Conference 'Laser Technologies-93'. Shatura, Russia,  
 14-16 April 1993  
 DT Conference Article; Journal; Translation Abstracted  
 TC Theoretical  
 CY Russian Federation; United States  
 LA English  
 AB We develop a nonlinear multimode theory of the generation of surface  
 defect-deformation (DD) periodic structures under the action of  
 high-energy beams. A nonlinear kinetic equation for Fourier amplitudes of  
 DD \*\*\*gratings\*\*\* is derived. The derived equation can be reduced to a  
 rate equation including diffusion and drift in the q-space. A general  
 solution to this equation is found, which gives an opportunity to describe  
 generation of multimode or single-mode DD structures. Spacings, times of  
 formation, and stationary amplitudes of DD \*\*\*gratings\*\*\* are  
 calculated. The results of calculations are used for interpreting  
 experimental data on the generation of DD \*\*\*gratings\*\*\* in \*\*\*Si\*\*\*  
 under the action of millisecond laser pulses and \*\*\*ion\*\*\*  
 \*\*\*implantation\*\*\* .  
 CC A4280F Gratings, echelles; A6820 Solid surface structure; A6180B  
 Ultraviolet, visible and infrared radiation; A4260K Laser beam  
 applications; A6170 Defects in crystals; A7865 Optical properties of thin

films; A4285D Surface grinding, fabrication  
CT CRYSTAL DEFECTS; DIFFRACTION \*\*\*GRATINGS\*\*\* ; LASER BEAM APPLICATIONS;  
OPTICAL WORKSHOP TECHNIQUES; SURFACE STRUCTURE  
ST nonlinear kinetic equation; high-power laser radiation; nonlinear  
multimode theory; generation; surface defect-deformation periodic  
structures; Fourier amplitudes; rate equation; q-space; drift; diffusion;  
millisecond laser pulses; \*\*\*ion implantation\*\*\* ;  
\*\*\*defect-deformation gratings\*\*\* ; stationary amplitudes; spacings;  
times of formation; single mode defect-deformation structures; multimode  
defect-deformation structures  
ET Si  
L7 ANSWER 151 OF 187 INSPEC (C) 2006 IEE on STN  
AN 1994:4694367 INSPEC DN A9415-0785-005; B9408-4190F-001  
TI Electron-beam-deposited Mo/ \*\*\*Si\*\*\* and MoSi/ \*\*\*Si\*\*\* multilayer  
x-ray mirrors and \*\*\*gratings\*\*\* .  
AU Schmiedeskamp, B.; Klodt, A.; Stock, H.-J.; Kleineberg, U.; Dohring, T.;  
Propper, M.; Rahn, S.; Hilgers, K.; Heidemann, B.; Tappe, T.; Heinzmann,  
U. (Fakultat fur Phys., Bielefeld Univ., Germany); Krumrey, M.K.; Muller,  
P.; Scholze, F.; Heidemann, K.F.  
SO Optical Engineering (April 1994) vol.33, no.4, p.1314-21. 38 refs.  
Price: CCCC 0091-3286/94/\$6.00  
CODEN: OPEGAR ISSN: 0091-3286  
DT Journal  
TC Experimental  
CY United States  
LA English  
AB For the wavelength region above the \*\*\*Si\*\*\* -L edge normal incidence,  
soft x-ray mirrors are produced with peak reflectivities close to 60%. The  
multilayer systems consist of molybdenum and \*\*\*silicon\*\*\* and are  
fabricated by electron beam evaporation in ultrahigh vacuum. A smoothing  
of the boundaries, and thereby a drastic enhancement of the reflectivity,  
is obtained by thermal treatment of the multilayer systems during growth.  
The thermal stability of the multilayer stacks could be improved  
considerably up to 850 degrees C by mixing Mo and \*\*\*Si\*\*\* in the  
absorber layers and producing thus MoSi/ \*\*\*Si\*\*\* multilayers with x  
and y denoting the amounts of Mo and \*\*\*Si\*\*\* in the absorber layer,  
respectively. First attempts are reported to produce mirrors with a  
bilayer thickness of 2.6 nm. An improvement in the quality of these  
interfaces can be obtained by \*\*\*bombardment\*\*\* with Ar+ \*\*\*ions\*\*\*  
. We report on normal incidence reflectivity measurements of the mirrors  
with synchrotron radiation and finally on the normal incidence diffraction  
efficiencies of a Mo/ \*\*\*Si\*\*\* multilayer coated \*\*\*grating\*\*\* , for  
which values of 5.5% are achieved for the +1'st and -1'st diffraction  
orders.  
CC A0785 X-ray, gamma-ray instruments and techniques; A8115G Vacuum  
deposition; A4280F Gratings, echelles; A4285 Optical testing and workshop  
techniques; A4278H Coatings; B4190F Optical coatings and filters; B0520F  
Vapour deposition  
CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; ELECTRON BEAM DEPOSITION; ELEMENTAL  
SEMICONDUCTORS; MIRRORS; MOLYBDENUM; MOLYBDENUM ALLOYS; OPTICAL FILMS;  
OPTICAL WORKSHOP TECHNIQUES; \*\*\*SILICON\*\*\* ; X-RAY OPTICS  
ST electron-beam-deposited; \*\*\*Mo/Si\*\*\* ; \*\*\*MoSi/Si\*\*\* ; multilayer  
x-ray mirrors; \*\*\*gratings\*\*\* ; \*\*\*Si-L edge\*\*\* ; normal incidence;  
soft x-ray mirrors; peak reflectivities; electron beam evaporation;  
ultrahigh vacuum; thermal treatment; multilayer systems; thermal  
stability; multilayer stacks; absorber layers; absorber layer; bilayer  
thickness; Ar+ ions; normal incidence reflectivity measurements;  
synchrotron radiation; normal incidence diffraction efficiencies; 5.5  
percent; 850 C; \*\*\*Mo-Si\*\*\* ; \*\*\*MoSi-Si\*\*\*  
CHI Mo-Si int, Mo int, Si int, Mo el, Si el; MoSi-Si int, MoSi int, Mo int, Si  
int, MoSi bin, Mo bin, Si bin, Si el  
PHP efficiency 5.5E+00 percent; temperature 1.12E+03 K  
ET Mo; Mo\*Si; Mo sy 2; sy 2; Si sy 2; MoSi/Si; Mo cp; cp; Si cp; Si; C; Ar;  
Ar+; Ar ip 1; ip 1; MoSi/Si; Mo-Si; MoSi; MoSi-Si  
L7 ANSWER 152 OF 187 INSPEC (C) 2006 IEE on STN  
AN 1994:4673403 INSPEC DN A9412-0130C-040; B9406-0100-123  
TI Proceedings of Europhysics Industrial Workshop on Nanometre- Scale Methods  
in x-ray Technology.  
SO Eindhoven, Netherlands: Philips Res. Lab, 1993. 52 pp.  
Conference: Veldhoven, Netherlands, 11-13 Oct 1993



Sponsor(s): Comm. Eur. Communities; Found. Physica; Newport B.V.; et al

DT Conference Proceedings

CY Netherlands

LA English

AB The following topics were dealt with: X-ray diffuse scattering; X-ray reflectometry; X-ray reflection from rough periodic multilayers; thin layer diffraction; surface \*\*\*grating\*\*\* diffraction; multilayer diffraction \*\*\*grating\*\*\* properties; \*\*\*ion\*\*\*  
 \*\*\*bombardment\*\*\* application in the modification of Mo/ \*\*\*Si\*\*\* multilayers; sputtered multilayers design and manufacture; multilayer structures application; X-ray standing wave method; soft X-ray spectrometry; nanometer scale method in X-ray spectroscopy for space research; soft X-ray reflectometry; dispersive elements design and manufacture; evaluation of roughness in multilayer structures; laser plasma sources for soft X-ray projection lithography; Helios X-ray source; submicron in micropositioning; and X-ray \*\*\*gratings\*\*\* and projection lithography.

CC A0130C Conference proceedings; A0785 X-ray, gamma-ray instruments and techniques; A6110 X-ray determination of structures; A5250J Plasma production and heating by laser beams; B0100 General electrical engineering topics; B2550G Lithography; B7450 X-ray and gamma-ray equipment

CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; ION BEAM APPLICATIONS; NANOTECHNOLOGY; PLASMA PRODUCTION AND HEATING BY LASER BEAM; REFLECTOMETRY; SPACE RESEARCH; SPUTTERED COATINGS; SURFACE TOPOGRAPHY; X-RAY CRYSTALLOGRAPHY; X-RAY LITHOGRAPHY; X-RAY PRODUCTION; X-RAY SPECTROMETERS; X-RAY SPECTROSCOPY

ST semiconductors; X-ray diffuse scattering; X-ray reflectometry; X-ray reflection; rough periodic multilayers; thin layer diffraction;  
 \*\*\*surface grating diffraction\*\*\* ; \*\*\*multilayer diffraction\*\*\*  
 \*\*\* grating\*\*\* ; \*\*\*ion bombardment\*\*\* ; sputtered multilayers design; manufacture; X-ray standing wave method; soft X-ray spectrometry; nanometer scale method; X-ray spectroscopy; space research; dispersive elements design; laser plasma sources; soft X-ray projection lithography; Helios X-ray source; micropositioning; \*\*\*X-ray gratings\*\*\* ;  
 \*\*\*Mo-Si multilayers\*\*\*

CHI Mo-Si int, Mo int, Si int, Mo el, Si el

ET Mo; Mo\*Si; Mo sy 2; sy 2; Si sy 2; Mo-Si; Si

L7 ANSWER 153 OF 187 INSPEC (C) 2006 IEE on STN

AN 1994:4672506 INSPEC DN A9412-4265K-020; B9406-4340-093

TI Photoinduced second-harmonic generation in fibers \*\*\*doped\*\*\* with rare-earth \*\*\*ions\*\*\* .

AU Dianov, E.M. (Gen. Phys. Inst., Acad. of Sci., Moscow, Russia); Kornienko, L.S.; Rybaltovsky, A.O.; Chernov, P.V.; Yatsenko, Yu.P.

SO Optics Letters (1 April 1994) vol.19, no.7, p.439-41. 6 refs.  
 Price: CCCC 0146-9592/94/070439-03\$6.00/0  
 CODEN: OPLEDP ISSN: 0146-9592

DT Journal

TC Experimental

CY United States

LA English

AB Photoinduced second-harmonic generation in silica fibers doped with Er<sup>3+</sup>, Sm<sup>3+</sup>, and Tb<sup>3+</sup> has been investigated. Er<sup>3+</sup>-doped fibers have been found to tune a chi (2) \*\*\*grating\*\*\* easily to the mode structure of the laser radiation, whereas Sm<sup>3+</sup>-doped fibers have been found to possess the greatest resistance to chi (2) \*\*\*grating\*\*\* erasure by radiation at 532 nm. From the beginning of the preparation processes, the third harmonic at 355 nm is registered in all the fibers.

CC A4265K Harmonic generation, frequency conversion, parametric oscillation and amplification; A4281F Other optical properties; B4340 Nonlinear optics and devices; B4125 Fibre optics

CT ERBIUM; OPTICAL FIBRES; OPTICAL HARMONIC GENERATION; SAMARIUM;  
 \*\*\*SILICON\*\*\* COMPOUNDS; TERBIUM

ST photoinduced second-harmonic generation; \*\*\*rare-earth ion doped\*\*\*  
 \*\*\* fibers\*\*\* ; aluminosilicate fibers; laser radiation mode structure; third harmonic; \*\*\*chi (2) grating erasure\*\*\* ; germanosilicate fibers; temporal evolution; erasure rates; 532 nm; 355 nm; Al<sub>2</sub>O<sub>3</sub>SiO<sub>2</sub>:Er; Al<sub>2</sub>O<sub>3</sub>SiO<sub>2</sub>:Sm; Al<sub>2</sub>O<sub>3</sub>SiO<sub>2</sub>:Tb; GeO<sub>2</sub>SiO<sub>2</sub>:Er

CHI Al<sub>2</sub>O<sub>3</sub>SiO<sub>2</sub>:Er ss, Al<sub>2</sub>O<sub>3</sub>SiO<sub>2</sub> ss, Al<sub>2</sub>O<sub>3</sub> ss, SiO<sub>2</sub> ss, Al<sub>2</sub> ss, Al ss, Er ss, O<sub>2</sub> ss, O<sub>3</sub> ss, Si ss, O ss, Er el, Er dop; Al<sub>2</sub>O<sub>3</sub>SiO<sub>2</sub>:Sm ss, Al<sub>2</sub>O<sub>3</sub>SiO<sub>2</sub> ss, Al<sub>2</sub>O<sub>3</sub> ss, SiO<sub>2</sub> ss, Al<sub>2</sub> ss, Al ss, O<sub>2</sub> ss, O<sub>3</sub> ss, Si ss, Sm ss, O ss, Sm el,

Sm dop; Al2O3SiO2:Tb ss, Al2O3SiO2 ss, Al2O3 ss, SiO2 ss, Al2 ss, Al ss, O2 ss, O3 ss, Si ss, Tb ss, O ss, Tb el, Tb dop; GeO2SiO2:Er ss, GeO2SiO2 ss, GeO2 ss, SiO2 ss, Er ss, Ge ss, O2 ss, Si ss, O ss, Er el, Er dop

PHP wavelength 5.32E-07 m; wavelength 3.55E-07 m

ET Er; Er3+; Er ip 3; ip 3; Sm; Sm3+; Sm ip 3; Tb; Tb3+; Tb ip 3; Al\*Er\*O\*Si; Al sy 4; sy 4; Er sy 4; O sy 4; Si sy 4; Al2O3SiO2:Er; Er doping; doped materials; Al cp; cp; O cp; Si cp; Al\*O\*Si\*Sm; Sm sy 4; Al2O3SiO2:Sm; Sm doping; Al\*O\*Si\*Tb; Tb sy 4; Al2O3SiO2:Tb; Tb doping; Er\*Ge\*O\*Si; Ge sy 4; GeO2SiO2:Er; Ge cp; Al\*O\*Si; Al sy 3; sy 3; O sy 3; Si sy 3; Al2O3SiO; Al\*O; Al2O; O\*Si; SiO; Al; O; Si; Ge\*O\*Si; Ge sy 3; GeO2SiO; Ge\*O; GeO; Ge

L7 ANSWER 154 OF 187 INSPEC (C) 2006 IEE on STN

AN 1994:4663399 INSPEC DN A9411-6180B-008

TI The nonlinear multimode theory of defect deformational ordered surface structures generation by strong laser beams.

AU Emel'yanov, V.I.; Shlykov, Yu.G. (Int. Laser Center, Moscow State Univ., Russia)

SO Laser Physics (Jan.-Feb. 1994) vol.4, no.1, p.153-67. 31 refs.  
CODEN: LAPHEJ ISSN: 1054-660X

DT Journal

TC Theoretical; Experimental

CY United States

LA English

AB The multimode nonlinear theory of formation of surface periodic point defect deformational (DD) structures is developed. The general set of coupled nonlinear kinetic equations for DD \*\*\*gratings\*\*\* of the Fourier amplitudes is derived and reduced to the rate equation with allowance for diffusion and drift in q-space. The conditions of generation of either multimode or single-mode DD structures are investigated, and periods, times of formation, and stationary amplitudes of DD \*\*\*gratings\*\*\* are determined. The theoretical results are used for interpretation of previously obtained experimental results on the generation of DD \*\*\*gratings\*\*\* in \*\*\*Si\*\*\* under millisecond laser irradiation and under \*\*\*ion\*\*\* \*\*\*implantation\*\*\*.

CC A6180B Ultraviolet, visible and infrared radiation; A6170E Other point defects

CT LASER BEAM EFFECTS; LASER MODES; POINT DEFECTS; SURFACE STRUCTURE

ST surface periodic point defect deformational structures; \*\*\*defect\*\*\*  
\*\*\* deformational gratings\*\*\*; single mode defect deformational structures; multimode defect deformational structures; nonlinear multimode theory; defect deformational ordered surface structures generation; strong laser beams; general set; coupled nonlinear kinetic equations; Fourier amplitudes; diffusion; drift; q-space; stationary amplitudes; \*\*\*ion\*\*\*  
\*\*\* implantation\*\*\*

ET Si

L7 ANSWER 155 OF 187 INSPEC (C) 2006 IEE on STN

AN 1994:4568389 INSPEC DN A9404-7847-001

TI Fast photothermal relaxation processes in metals and semiconductors studied using transient reflecting \*\*\*gratings\*\*\*.

AU Nishimura, H.; Harata, A.; Sawada, T. (Dept. of Ind. Chem., Tokyo Univ., Japan)

SO Japanese Journal of Applied Physics, Part 1 (Regular Papers & Short Notes) (Nov. 1993) vol.32, no.11A, p.5149-54. 20 refs.  
CODEN: JAPNDE ISSN: 0021-4922

DT Journal

TC Experimental

CY Japan

LA English

AB Dynamic processes forming the transient reflecting \*\*\*gratings\*\*\* are experimentally investigated in the picosecond time regime for both metals and semiconductors. The shapes of the initial parts of the \*\*\*grating\*\*\* signals were examined with respect to the pump and probe intensities, optical configurations of polarization directions and \*\*\*ion\*\*\* \*\*\*implantation\*\*\* doses. For metals, the rising part is influenced by the temperature \*\*\*grating\*\*\* independently of the corrugation \*\*\*grating\*\*\* due to surface acoustic waves. For \*\*\*silicon\*\*\*, the peak or shoulder at the initial part is attributed to the concentration \*\*\*grating\*\*\* of the photoexcited carriers, and it directly reflects the photothermal relaxation rate.

CC A7847 Time-resolved optical spectroscopies and other ultrafast optical measurements in condensed matter; A4280F Gratings, echelles; A6590 Other

topics in thermal properties of condensed matter; A4280W Ultrafast optical techniques; A6825 Mechanical and acoustical properties of solid surfaces and interfaces

CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; HIGH-SPEED OPTICAL TECHNIQUES; \*\*\*ION\*\*\*  
 \*\*\*IMPLANTATION\*\*\* ; METALS; PHOTOTHERMAL EFFECTS; SEMICONDUCTORS;  
 SURFACE ACOUSTIC WAVES

ST photothermal relaxation; metals; semiconductors; \*\*\*transient reflecting\*\*\*  
 \*\*\* gratings\*\*\* ; dynamic processes; \*\*\*ion implantation\*\*\* ;  
 \*\*\*temperature grating\*\*\* ; surface acoustic waves; \*\*\*corrugation\*\*\*  
 \*\*\* grating\*\*\* ; photoexcited carriers; \*\*\*concentration grating\*\*\* ;  
 picosecond time regime; \*\*\*Si\*\*\*

CHI Si sur, Si el  
 ET Si

L7 ANSWER 156 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1993:4559661 INSPEC DN A9403-6170T-011; B9402-2550B-015  
 TI Enhanced photoluminescence from AlGaAs/GaAs superlattice \*\*\*gratings\*\*\*  
 fabricated by \*\*\*Si\*\*\* FIB implantation.  
 AU Steckl, A.J.; Chen, P.; Choo, A.G.; Jackson, H.E.; Boyd, J.T. (Cincinnati Univ., OH, USA); Ezis, A.; Pronko, P.P.; Novak, S.W.; Kolbas, R.M.  
 SO Semiconductor Heterostructures for Photonic and Electronic Applications Symposium  
 Editor(s): Tu, C.W.; Houghton, D.C.; Tung, R.T.  
 Pittsburgh, PA, USA: Mater. Res. Soc, 1993. p.319-24 of xvii+836 pp. 6 refs.  
 Conference: Boston, MA, USA, 30 Nov-4 Dec 1992

DT Conference Article  
 TC Experimental  
 CY United States  
 LA English  
 AB Results are presented on the fabrication of optical \*\*\*gratings\*\*\* on an Al<sub>0.3</sub>Ga<sub>0.7</sub>As/GaAs superlattice (SL) with equal 3.5 nm barrier and well widths, by using locally FIB-enhanced mixing. As the first step, the mechanism of the mixing was studied. \*\*\*Si\*\*\* ++ was accelerated to 50 kV and 100 kV and implanted at doses ranging from 10<sup>13</sup> to 10<sup>15</sup>/cm<sup>2</sup>. A rapid thermal anneal of 10 s at 950 degrees C was utilized. The average Al inter-diffusion coefficient and length were calculated as a function of FIB dose from SIMS depth profiling. The mixing was significantly enhanced by the FIB \*\*\*implantation\*\*\*. The \*\*\*ion\*\*\* dose as low as 1\*10<sup>14</sup>/cm<sup>2</sup> followed by RTA yields a mixing parameter of approximately 90% and results in a two-order of magnitude increase in the diffusion coefficient, to a value of 4.5\*10<sup>-14</sup> cm<sup>2</sup>/sec, in contrast to 1.3\*10<sup>-16</sup> cm<sup>2</sup>/sec from RTA-only. The maximum mixing occurred in the region where neither \*\*\*Si\*\*\* ions nor vacancies have their maximum concentration. Instead, it coincides with the location of the positive maximum of the second derivative of the vacancy concentration profile. This fact suggests that in the time frame of RTA and with low dose, the diffusion of nonequilibrium point defects plays a major role in the process of enhancing Al-Ga interdiffusion. DBR optical \*\*\*gratings\*\*\*, consisting of thousands of spacing lines with 350 nm period, were fabricated with a 1000 kV FIB dose of 2\*10<sup>13</sup> and 1\*10<sup>14</sup>/cm<sup>2</sup>. Photoluminescence (PL) spectra were taken from the \*\*\*grating\*\*\* region as well as the unimplanted superlattice region. The PL intensity from cavity region of the DBR was about 16 times higher than that from the original SL. This PL enhancement was verified to occur in the cavity region only by spatially scanning over the entire sample. A possible mechanism for this PL enhancement is optical feedback provided by the \*\*\*gratings\*\*\*.

CC A6170T Doping and implantation of impurities; A6170A Annealing processes; A6822 Surface diffusion, segregation and interfacial compound formation; A7855D Tetrahedrally bonded nonmetals; A6180J Ions; A6630N Chemical interdiffusion; A7865J Nonmetals; B2550B Semiconductor doping

CT ALUMINIUM COMPOUNDS; ANNEALING; CHEMICAL INTERDIFFUSION; DIFFRACTION  
 \*\*\*GRATINGS\*\*\* ; GALLIUM ARSENIDE; III-V SEMICONDUCTORS; ION BEAM MIXING;  
 \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; LUMINESCENCE OF INORGANIC SOLIDS;  
 PHOTOLUMINESCENCE; RAPID THERMAL PROCESSING; SECONDARY ION MASS SPECTRA;  
 SEMICONDUCTOR SUPERLATTICES; \*\*\*SILICON\*\*\* ; SURFACE DIFFUSION;  
 VACANCIES (CRYSTAL)

ST semiconductors; photoluminescence; \*\*\*optical gratings\*\*\* ;  
 superlattice; FIB-enhanced mixing; rapid thermal anneal; inter-diffusion coefficient; SIMS depth profiling; implantation; vacancies; point defects;  
 \*\*\*DBR optical gratings\*\*\* ; 950 degC; \*\*\*Al<sub>0.3</sub>Ga<sub>0.7</sub>As:Si-GaAs\*\*\*

CHI Al<sub>0.3</sub>Ga<sub>0.7</sub>As:Si-GaAs int, Al<sub>0.3</sub>Ga<sub>0.7</sub>As:Si int, Al<sub>0.3</sub>Ga<sub>0.7</sub>As int, Al<sub>0.3</sub>

int, Ga0.7 int, GaAs int, Al int, As int, Ga int, Si int, Al0.3Ga0.7As:Si ss, Al0.3Ga0.7As ss, Al0.3 ss, Ga0.7 ss, Al ss, As ss, Ga ss, Si ss, GaAs bin, As bin, Ga bin, Si el, Si dop

PHP temperature 1.22E+03 K

ET Al\*As\*Ga; Al sy 3; sy 3; As sy 3; Ga sy 3; AlGaAs; Al cp; cp; Ga cp; As cp; As\*Ga; As sy 2; sy 2; Ga sy 2; GaAs; Si; Al0.3Ga0.7As; Si++; Si ip 1; ip 1; C; Al; Al\*Ga; Al sy 2; Al-Ga; V; Al\*As\*Ga\*Si; Al sy 4; sy 4; As sy 4; Ga sy 4; Si sy 4; Al0.3Ga0.7As:Si; Si doping; doped materials; Al0.3Ga0.7As:Si-GaAs; Ga; As

L7 ANSWER 157 OF 187 INSPEC (C) 2006 IEE on STN

AN 1993:4530719 INSPEC DN A9401-6825-003

TI Laser-stimulated scattering microscope study of an \*\*\*ion\*\*\* -  
\*\*\*implanted\*\*\* \*\*\*silicon\*\*\* surface.

AU Harata, A.; Shen, Q.; Tanaka, T.; Sawada, T. (Dept. of Ind. Chem., Tokyo Univ., Japan)

SO Japanese Journal of Applied Physics, Part 1 (Regular Papers & Short Notes) (Aug. 1993) vol.32, no.8, p.3633-8. 27 refs.  
CODEN: JAPNDE ISSN: 0021-4922

DT Journal

TC Theoretical; Experimental

CY Japan

LA English

AB Surface modification of a \*\*\*silicon\*\*\* single crystal induced by argon \*\*\*ion\*\*\* \*\*\*implantation\*\*\* (light dose, 300 keV, 1011 atoms/cm2) has been investigated using a laser-stimulated scattering microscope, whose operational principle is based on microscopic measurements of transient reflecting \*\*\*gratings\*\*\* (TRGs). One-dimensional distributions of various material parameters, velocity, onset time and attenuation coefficient of surface acoustic waves and parameters relating to thermal diffusion, thermal expansion and optical absorption, are determined by analyzing the TRG responses measured sequentially along a line across the implanted and unimplanted regions. Some theoretical aspects are presented for the empirical equation used in deducing these parameters from the TRG responses. The change in the anisotropic property of the acoustic velocity is also discussed.

CC A6825 Mechanical and acoustical properties of solid surfaces and interfaces; A8160C Semiconductors; A6170T Doping and implantation of impurities; A6180J Ions; A6265 Acoustic properties of solids; A4320 General linear acoustics; A6670 Nonelectronic thermal conduction and heat-pulse propagation in nonmetallic solids; A6570 Thermal expansion and thermomechanical effects; A4390 Other topics in acoustics; A7820D Optical constants and parameters; A6180B Ultraviolet, visible and infrared radiation; A7920D Laser-light impact phenomena; A0765 Optical spectroscopy and spectrometers

CT ACOUSTIC WAVE ABSORPTION; ACOUSTIC WAVE VELOCITY; ARGON; ELEMENTAL SEMICONDUCTORS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; LASER BEAM EFFECTS; LIGHT ABSORPTION; PHOTOACOUSTIC SPECTRA; \*\*\*SILICON\*\*\* ; SURFACE ACOUSTIC WAVES; SURFACE TREATMENT; THERMAL DIFFUSION; THERMAL EXPANSION

ST semiconductor; acoustic onset time; SAW; acoustic attenuation coefficient; 1D distribution; laser-stimulated scattering microscope; \*\*\*transient\*\*\*  
\*\*\* reflecting gratings\*\*\* ; surface acoustic waves; thermal diffusion; thermal expansion; optical absorption; empirical equation; anisotropic property; acoustic velocity; \*\*\*Si surface modification\*\*\* ;  
\*\*\*Si:Ar+ implanted surface\*\*\*

CHI Si sur, Si el; Si:Ar sur, Ar sur, Si sur, Si:Ar bin, Ar bin, Si bin, Ar el, Si el, Ar dop

ET D; Si; Ar\*Si; Si:Ar; Si:Ar+; Ar+ doping; doped materials; Ar doping; Ar

L7 ANSWER 158 OF 187 INSPEC (C) 2006 IEE on STN

AN 1993:4529826 INSPEC DN A9401-4280F-002

TI Maskless writing of submicrometer \*\*\*gratings\*\*\* in fused silica by focused \*\*\*ion\*\*\* beam \*\*\*implantation\*\*\* and differential wet etching.

AU Albert, J.; Hill, K.O.; Malo, B.; Johnson, D.C.; Bilodeau, F. (Communication Res. Centre, Ottawa, Ont., Canada); Templeton, I.M.; Brebner, J.L.

SO Applied Physics Letters (25 Oct. 1993) vol.63, no.17, p.2309-11. 14 refs.  
Price: CCCC 0003-6951/93/63(17)/2309/3/\$6.00  
CODEN: APPLAB ISSN: 0003-6951

DT Journal

TC Experimental

CY United States  
 LA English  
 AB Surface relief \*\*\*gratings\*\*\* with submicrometer periods have been fabricated in silica by \*\*\*ion\*\*\* \*\*\*implantation\*\*\* with a focused \*\*\*ion\*\*\* beam, followed by etching in diluted hydrofluoric acid. Implanted silica etches three times faster than unimplanted silica and groove depths of the order of 300 nm have been achieved. The method does not require photolithography or masking layers, allows arbitrary patterns to be defined, and may be used to fabricate diffractive optical elements or \*\*\*grating\*\*\* filters in optical waveguides.  
 CC A4280F Gratings, echelles; A4285D Surface grinding, fabrication  
 CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; ETCHING; FOCUSED ION BEAM TECHNOLOGY; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; OPTICAL WORKSHOP TECHNIQUES; \*\*\*SILICON\*\*\* COMPOUNDS  
 ST maskless writing; \*\*\*submicrometer gratings\*\*\* ; fused silica; \*\*\*focused ion beam implantation\*\*\* ; differential wet etching; \*\*\*surface relief gratings\*\*\* ; fabrication; diluted hydrofluoric acid; diffractive optical elements; \*\*\*grating filters\*\*\* ; optical waveguides; patterns; groove; 300 nm; SiO<sub>2</sub>; HF  
 CHI SiO<sub>2</sub> sur, O<sub>2</sub> sur, Si sur, O sur, SiO<sub>2</sub> bin, O<sub>2</sub> bin, Si bin, O bin; HF bin, F bin, H bin  
 PHP size 3.0E-07 m  
 ET O\*Si; SiO<sub>2</sub>; Si cp; cp; O cp; F\*H; HF; H cp; F cp; SiO; O; Si  
  
 L7 ANSWER 159 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1993:4484117 INSPEC DN A9321-6170W-001; B9311-2550B-002  
 TI Lateral straggle of \*\*\*Si\*\*\* and Be focused- \*\*\*ion\*\*\* beam \*\*\*implanted\*\*\* in GaAs.  
 AU Vignaud, D.; Musil, C.R.; Etchin, S.; Antoniadis, D.A.; Melngailis, J. (Res. Lab. of Electron., MIT, Cambridge, MA, USA)  
 SO Journal of Vacuum Science & Technology B (Microelectronics Processing and Phenomena) (May-June 1993) vol.11, no.3, p.581-6. 27 refs.  
 Price: CCCC 0734-211X/93/030581-06\$01.00  
 CODEN: JVTBD9 ISSN: 0734-211X  
 DT Journal  
 TC Experimental  
 CY United States  
 LA English  
 AB The lateral distribution of focused- \*\*\*ion\*\*\* -beam \*\*\*implanted\*\*\* \*\*\*Si\*\*\* and Be atoms has been studied by measuring the electrical resistivity in \*\*\*grating\*\*\* structures. The \*\*\*gratings\*\*\* which were oriented perpendicular to the direction of the current flow were implanted with \*\*\*silicon\*\*\* and beryllium at 280 and 260 keV, respectively. They were implanted into semi-insulating materials cut on and off axis, and then rapid thermal annealed. The lateral straggle was found to be less than 100 nm for \*\*\*Si\*\*\* and equal to 190 nm for the Be implants. The standard deviation of the lateral distribution was found to increase with the dose. This is attributed to a concentration-dependent diffusion which results in an anomalously high diffusion coefficient. Comparison of the experimental parameters of the implanted distribution with values found in standard tables or calculated by a Monte Carlo TRIM code seems to indicate that all simulations overestimate the lateral straggle at the expense of the penetration depth.  
 CC A6170W Impurity concentration, distribution, and gradients; A6170T Doping and implantation of impurities; A6630J Diffusion, migration, and displacement of impurities; A6180M Channelling, blocking and energy loss of particles; A6170A Annealing processes; B2550B Semiconductor doping; B2520D II-VI and III-V semiconductors  
 CT ANNEALING; BERYLLIUM; DIFFUSION IN SOLIDS; DOPING PROFILES; ENERGY LOSS OF PARTICLES; FOCUSED ION BEAM TECHNOLOGY; GALLIUM ARSENIDE; III-V SEMICONDUCTORS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; RAPID THERMAL PROCESSING; \*\*\*SILICON\*\*\*  
 ST III-V semiconductor; \*\*\*focused-ion beam implanted\*\*\* ; lateral distribution; electrical resistivity; \*\*\*grating structures\*\*\* ; semi-insulating materials; rapid thermal annealed; lateral straggle; concentration-dependent diffusion; anomalously high diffusion coefficient; Monte Carlo TRIM code; penetration depth; 280 keV; 260 keV; GaAs:Be; \*\*\*GaAs:Si\*\*\*  
 CHI GaAs:Be int, GaAs int, As int, Be int, Ga int, GaAs:Be ss, As ss, Be ss, Ga ss, GaAs bin, As bin, Ga bin, Be el, Be dop; GaAs:Si int, GaAs int, As int, Ga int, Si int, GaAs:Si ss, As ss, Ga ss, Si ss, GaAs bin, As bin, Ga bin, Si el, Si dop

PHP electron volt energy 2.8E+05 eV; electron volt energy 2.6E+05 eV  
 ET Si; Be; As\*Ga; As sy 2; sy 2; Ga sy 2; GaAs; Ga cp; cp; As cp; V;  
 As\*Be\*Ga; As sy 3; sy 3; Be sy 3; Ga sy 3; GaAs:Be; Be doping; doped  
 materials; As\*Ga\*Si; Si sy 3; GaAs:Si; Si doping; As; Ga

L7 ANSWER 160 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1993:4414672 INSPEC DN A9313-8115H-029  
 TI Electron cyclotron resonance microwave discharge for oxide deposition  
 using tetramethylcyclotetrasiloxane.  
 AU Pai, C.S.; Miner, J.F.; Foo, P.D. (AT&T Bell Labs., Murray Hill, NJ, USA)  
 SO Journal of Applied Physics (1 April 1993) vol.73, no.7, p.3531-8. 22 refs.  
 Price: CCCC 0021-8979/93/073531-08\$06.00  
 CODEN: JAPIAU ISSN: 0021-8979

DT Journal  
 TC Experimental  
 CY United States  
 LA English  
 AB Results of the dielectric oxide films deposited at 300 degrees C using  
 tetramethylcyclotetrasiloxane/oxygen chemistry in a reactor with electron  
 cyclotron resonance microwave discharge presented. The authors have found  
 that quality oxide is deposited with an O2/tetramethylcyclotetrasiloxane  
 flow-rate ratio of greater than 3. The properties of the deposited films  
 are characterized by prism \*\*\*coupler\*\*\*, infrared spectroscopy, Auger  
 electron spectroscopy, Rutherford backscattering spectrometry, and  
 triangular voltage sweep measurements. The deposition rate using  
 tetramethylcyclotetrasiloxane is found to be about four times higher than  
 tetraethylorthosilicate under similar processing conditions. The authors  
 have obtained oxide films with superior quality (both material and  
 electrical properties) at a deposition rate of 5000 AA/min. The step  
 coverage of oxide is found to be excellent when RF bias is applied on the  
 substrate during the deposition. They have demonstrated that trenches with  
 aspect ratios >1.50 can be filled without voids. Details of reaction  
 chemistries for oxide deposition in the electron cyclotron resonance  
 reactor and the effect of \*\*\*ion\*\*\* \*\*\*bombardment\*\*\* on the oxide  
 profile are discussed.

CC A8115H Chemical vapour deposition; A6855 Thin film growth, structure, and  
 epitaxy; A7865J Nonmetals; A7830G Infrared and Raman spectra in inorganic  
 crystals; A7920N Atom, molecule, and ion impact  
 CT AUGER EFFECT; DIELECTRIC THIN FILMS; INFRARED SPECTRA OF INORGANIC SOLIDS;  
 PLASMA CVD; RUTHERFORD BACKSCATTERING; \*\*\*SILICON\*\*\* COMPOUNDS  
 ST ECR microwave deposition; CVD; oxide deposition;  
 tetramethylcyclotetrasiloxane; dielectric oxide films; flow-rate; infrared  
 spectroscopy; Auger electron spectroscopy; Rutherford backscattering;  
 triangular voltage sweep measurements; step coverage; \*\*\*ion\*\*\*  
 \*\*\* bombardment\*\*\*; SiOx

CHI SiO bin, Si bin, O bin  
 ET C; O2; O\*Si; SiOx; Si cp; cp; O cp; SiO; Si; O

L7 ANSWER 161 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1993:4411552 INSPEC DN A9313-0760P-003; B9307-4360-002  
 TI Laser stimulated scattering microscope: a tool for investigating modified  
 metallic surfaces.  
 AU Harata, A.; Nishimura, H.; Tanaka, T.; Sawada, T. (Dept. of Ind. Chem.,  
 Tokyo Univ., Japan)  
 SO Review of Scientific Instruments (March 1993) vol.64, no.3, p.618-22. 23  
 refs.  
 Price: CCCC 0034-6748/93/030618-05\$06.00  
 CODEN: RSINAK ISSN: 0034-6748

DT Journal  
 TC Experimental  
 CY United States  
 LA English  
 AB An instrument, based on the principle of microscopic measurements using  
 transient reflecting \*\*\*gratings\*\*\*, has been built for investigation  
 of modified metallic surfaces. After holographic illumination of focused  
 light pulses of short duration, dynamic processes are observed by  
 detecting the reflecting diffraction of the synchronously delayed probe  
 pulse, while the sample is two-dimensionally scanned. Distribution imaging  
 and relaxation time (or diffusivity) imaging are demonstrated for  
 \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* wafers.

CC A0760P Optical microscopy; A6820 Solid surface structure; A4265C  
 Stimulated Raman scattering and spectra; CARS; stimulated Brillouin and

stimulated Rayleigh scattering and spectra; A4260K Laser beam applications; A4240M Applications; B4360 Laser applications; B4350 Holography

CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; ELEMENTAL SEMICONDUCTORS; HOLOGRAPHY; MEASUREMENT BY LASER BEAM; MICROSCOPES; \*\*\*SILICON\*\*\* ; STIMULATED SCATTERING; SURFACE STRUCTURE

ST \*\*\*ion implanted wafers\*\*\* ; distribution imaging; 2D scanning; laser stimulated scattering microscope; modified metallic surfaces; microscopic measurements; \*\*\*transient reflecting gratings\*\*\* ; holographic illumination; focused light pulses; dynamic processes; reflecting diffraction; synchronously delayed probe pulse; relaxation time; diffusivity; \*\*\*Si\*\*\*

CHI Si int, Si el

ET D; Si

L7 ANSWER 162 OF 187 INSPEC (C) 2006 IEE on STN

AN 1993:4354891 INSPEC DN B9304-2560S-011

TI Submicrometre \*\*\*silicon\*\*\* permeable base transistors with buried CoSi2 gates.

AU Schuppen, A.; Vescan, L.; Marso, M.; Hart, A.v.d.; Luth, H. (Inst. fur Schicht und Ionentechnik, Forschungszentrum Julich, Germany); Beneking, H.

SO Electronics Letters (21 Jan. 1993) vol.29, no.2, p.215-17. 8 refs. Price: CCCC 0013-5194/93/\$7.50+0.00 CODEN: ELLEAK ISSN: 0013-5194

DT Journal

TC Practical; Theoretical

CY United Kingdom

LA English

AB \*\*\*Silicon\*\*\* permeable base transistors (PBTs) with monocrystalline buried CoSi2 gates have been fabricated by local high dose cobalt \*\*\*ion\*\*\* \*\*\*implantation\*\*\* through a grid-like mask into epitaxial \*\*\*Si\*\*\* (100) layers and homoepitaxial \*\*\*Si\*\*\* overgrowth by low-pressure vapour phase epitaxy. The PBTs show good DC characteristics and pinchoff at zero or at low negative gate voltages, respectively. Transistors with a \*\*\*grating\*\*\* periodicity of 0.6  $\mu\text{m}$  reach a maximum transconductance  $g_m$  of 70 mS/mm. The highest obtained transit frequency is  $f_T=6$  GHz.

CC B2560S Other field effect devices; B2560B Modelling and equivalent circuits; B2550B Semiconductor doping; B0510D Epitaxial growth

CT COBALT COMPOUNDS; ELEMENTAL SEMICONDUCTORS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; SCHOTTKY GATE FIELD EFFECT TRANSISTORS; SEMICONDUCTOR DEVICE MODELS; SEMICONDUCTOR EPITAXIAL LAYERS; SEMICONDUCTOR GROWTH; \*\*\*SILICON\*\*\* ; VAPOUR PHASE EPITAXIAL GROWTH

ST permeable base transistors; \*\*\*ion implantation\*\*\* ; grid-like mask; low-pressure vapour phase epitaxy; DC characteristics; pinchoff; negative gate voltages; \*\*\*grating periodicity\*\*\* ; maximum transconductance; transit frequency; \*\*\*Si-CoSi2\*\*\*

CHI Si-CoSi2 int, CoSi2 int, Si2 int, Co int, Si int, CoSi2 bin, Si2 bin, Co bin, Si bin, Si el

ET Co\*Si; Co sy 2; sy 2; Si sy 2; CoSi2; Co cp; cp; Si cp; Si; Si-CoSi2; CoSi; Si-CoSi; Co

L7 ANSWER 163 OF 187 INSPEC (C) 2006 IEE on STN

AN 1993:4328808 INSPEC DN A9305-7820D-002

TI Refractive-index changes in fused silica produced by heavy- \*\*\*ion\*\*\* \*\*\*implantation\*\*\* followed by photobleaching.

AU Albert, J.; Malo, B.; Hill, K.O.; Johnson, D.C. (Commun. Res. Center, Ottawa, Ont., Canada); Brebner, J.L.; Leonelli, R.

SO Optics Letters (1 Dec. 1992) vol.17, no.23, p.1652-4. 14 refs. Price: CCCC 0146-9592/92/231652-03\$5.00/0 CODEN: OPLEDP ISSN: 0146-9592

DT Journal

TC Experimental

CY United States

LA English

AB The changes in refractive index, optical absorption, and volume of synthetic fused silica resulting from the \*\*\*implantation\*\*\* of germanium and \*\*\*silicon\*\*\* \*\*\*ions\*\*\* at energies of 3 and 5 MeV are reported. Implantation changes the density and generates ultraviolet color centers in the silica, which increases the refractive index at visible wavelengths by approximately 1%. Irradiation of the implanted samples with 249-nm light from a KrF excimer laser photobleaches the color

centers and reduces the index by more than 0.1%. Photobleaching is used to write a 4.3-  $\mu$ m pitch diffraction \*\*\*grating\*\*\* in the implanted silica.

CC A7820D Optical constants and parameters; A7840H Other nonmetals; A7850E Insulators; A4265G Optical transient phenomena, self-induced transparency, optical saturation and related effects; A6170D Colour centres; A4270G Light-sensitive materials; A4280F Gratings, echelles; A6170T Doping and implantation of impurities; A6180J Ions

CT COLOUR CENTRES; DENSITY OF SOLIDS; DIFFRACTION \*\*\*GRATINGS\*\*\* ; IMPURITY AND DEFECT ABSORPTION SPECTRA OF INORGANIC SOLIDS; ION BEAM EFFECTS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; OPTICAL SATURABLE ABSORPTION; REFRACTIVE INDEX; \*\*\*SILICON\*\*\* COMPOUNDS; ULTRAVIOLET SPECTRA OF INORGANIC SOLIDS; VISIBLE SPECTRA OF INORGANIC SOLIDS

ST refractive index changes; photosensitivity; fused silica; \*\*\*heavy-ion\*\*\* \*\*\*implantation\*\*\* ; photobleaching; optical absorption; volume; density; ultraviolet color centers; visible wavelengths; \*\*\*diffraction\*\*\* \*\*\*grating\*\*\* ; 3 MeV; 5 MeV; 249 nm; KrF excimer laser; \*\*\*SiO<sub>2</sub>:Si\*\*\* ; SiO<sub>2</sub>:Ge

CHI SiO<sub>2</sub>:Si bin, SiO<sub>2</sub> bin, O<sub>2</sub> bin, Si bin, O bin, Si el, Si dop; SiO<sub>2</sub>:Ge ss, SiO<sub>2</sub> ss, Ge ss, O<sub>2</sub> ss, Si ss, O ss, SiO<sub>2</sub> bin, O<sub>2</sub> bin, Si bin, O bin, Ge el, Ge dop; KrF bin, Kr bin, F bin

PHP electron volt energy 3.0E+06 eV; electron volt energy 5.0E+06 eV; wavelength 2.49E-07 m

ET F\*Kr; KrF; Kr cp; cp; F cp; O\*Si; O sy 2; sy 2; Si sy 2; SiO<sub>2</sub>:Si; Si doping; doped materials; Si cp; O cp; Ge\*O\*Si; Ge sy 3; sy 3; O sy 3; Si sy 3; SiO<sub>2</sub>:Ge; Ge doping; SiO; Si; O; Ge; Kr

L7 ANSWER 164 OF 187 INSPEC (C) 2006 IEE on STN

AN 1992:4271571 INSPEC DN A9224-6825-003

TI Application of laser-induced GHz surface acoustic waves to evaluate \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* semiconductors.

AU Nishimura, H.; Harata, A.; Sawada, T. (Dept. of Ind. Chem., Fac. of Eng., Tokyo Univ., Japan)

SO Japanese Journal of Applied Physics, Supplement (1992) vol.31, suppl.31-1, p.91-3. 10 refs.  
CODEN: JJPYA5 ISSN: 0021-4922  
Conference: 12th Symposium on Ultrasonic Electronics. Tokyo, Japan, 2-4 Dec 1991  
Sponsor(s): Japan Soc. Appl. Phys

DT Conference Article; Journal

TC Experimental

CY Japan

LA English

AB The transient reflecting \*\*\*grating\*\*\* method has been used to characterize \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* layers and demonstrate its usefulness for nondestructive and remote evaluation of modified solid surfaces. The surface acoustic velocity, relaxation constant and signal intensity were measured as functions of ion dose. The results suggested that damage induced by implantation significantly affected the surface properties even under light dose conditions. The subnanosecond temporal resolution of the present method provided successful characterization of the implanted layers.

CC A6825 Mechanical and acoustical properties of solid surfaces and interfaces; A6180B Ultraviolet, visible and infrared radiation; A6170T Doping and implantation of impurities; A6180J Ions; A7840F Tetrahedrally bonded nonmetals; A4280F Gratings, echelles

CT DIFFRACTION \*\*\*GRATINGS\*\*\* ; ELEMENTAL SEMICONDUCTORS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; LASER BEAM EFFECTS; REFLECTIVITY; \*\*\*SILICON\*\*\* ; SURFACE ACOUSTIC WAVES

ST \*\*\*ion-implanted Si layers\*\*\* ; semiconductor; nondestructive evaluation; laser-induced GHz surface acoustic waves; \*\*\*transient\*\*\* \*\*\*reflecting grating method\*\*\* ; remote evaluation; modified solid surfaces; relaxation constant; signal intensity; ion dose; damage; surface properties; subnanosecond temporal resolution; implanted layers

ET Si

L7 ANSWER 165 OF 187 INSPEC (C) 2006 IEE on STN

AN 1991:4016823 INSPEC DN A91148117; B91077855

TI Fabrication and characteristics of GaAs-AlGaAs tunable laser diodes with DBR and phase-control sections integrated by compositional disordering of a quantum well.

AU Hirata, T.; Maeda, M.; Suehiro, M.; Hosomatsu, H. (Opt. Meas. Technol.



Dev. Co. Ltd., Tokyo, Japan)  
SO IEEE Journal of Quantum Electronics (June 1991) vol.27, no.6, p.1609-15.  
38 refs.  
Price: CCCC 0018-9197/91/0600-1609\$01.00  
CODEN: IEJQA7 ISSN: 0018-9197

DT Journal  
TC Practical; Experimental  
CY United States  
LA English  
AB GaAs-AlGaAs rib-waveguide graded-index separate-confinement  
heterostructure (GRINSCH) single-quantum-well (SQW) tunable distributed  
Bragg reflector (DBR) laser diodes were fabricated by EB lithography,  
\*\*\*ion\*\*\* \*\*\*implantation\*\*\* , and two-step metalorganic vapor phase  
epitaxy (MOVPE) growth. Active and passive waveguides were monolithically  
integrated by the compositional disordering of quantum-well  
heterostructures using \*\*\*silicon\*\*\* \*\*\*ion\*\*\*  
\*\*\*implantation\*\*\* . First-order \*\*\*gratings\*\*\* and rib waveguides  
were adopted with EB lithography to improve lasing characteristics, and  
they have wide application to photonic integrated circuits (PICs).  
Waveguide losses of partially disordered GRINSCH-SQW passive waveguides  
were as low as 4.4 cm<sup>-1</sup> at the lasing wavelength. A narrow linewidth as  
low as 560 kHz and a frequency tuning of more than 2.9 THz were obtained.  
The results show that this fabrication process is useful for PICs.

CC A4260B Design of specific laser systems; A4255P Lasing action in  
semiconductors with junctions; A4282 Integrated optics; A4260F Laser beam  
modulation, pulsing and switching; mode locking and tuning; B4320J  
Semiconductor junction lasers; B4140 Integrated optics

CT ALUMINIUM COMPOUNDS; DIFFRACTION \*\*\*GRATINGS\*\*\* ; DISTRIBUTED BRAGG  
REFLECTOR LASERS; ELECTRON BEAM LITHOGRAPHY; GALLIUM ARSENIDE; III-V  
SEMICONDUCTORS; INTEGRATED OPTICS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ;  
LASER TUNING; OPTICAL LOSSES; SEMICONDUCTOR GROWTH; SEMICONDUCTOR JUNCTION  
LASERS; VAPOUR PHASE EPITAXIAL GROWTH

ST III-V semiconductor; two step MOVPE; fabrication; electron beam  
lithography; quantum well compositional disordering; rib waveguide GRINSCH  
SQW LD; active waveguides; monolithic integration; \*\*\*Si ion\*\*\*  
\*\*\*implantation\*\*\* ; \*\*\*first order gratings\*\*\* ; GaAs-AlGaAs tunable  
laser diodes; DBR; phase-control sections; \*\*\*ion implantation\*\*\* ;  
passive waveguides; lasing characteristics; photonic integrated circuits;  
losses; narrow linewidth; frequency tuning; GaAs-AlGaAs;  
\*\*\*GaAs:Si-AlGaAs\*\*\*

CHI GaAs:Si-AlGaAs int, GaAs:Si int, AlGaAs int, GaAs int, Al int, As int, Ga  
int, Si int, GaAs:Si ss, AlGaAs ss, Al ss, As ss, Ga ss, Si ss, GaAs bin,  
As bin, Ga bin, Si el, Si dop; GaAs-AlGaAs int, AlGaAs int, GaAs int, Al  
int, As int, Ga int, AlGaAs ss, Al ss, As ss, Ga ss, GaAs bin, As bin, Ga  
bin

ET Al\*As\*Ga; Al sy 3; sy 3; As sy 3; Ga sy 3; GaAs; Ga cp; cp; As cp; AlGaAs;  
Al cp; GaAs-AlGaAs; Cs\*I\*P; PICs; P cp; I cp; Cs cp; V; Si; Al\*As\*Ga\*Si;  
Al sy 4; sy 4; As sy 4; Ga sy 4; Si sy 4; GaAs:Si; Si doping; doped  
materials; GaAs:Si-AlGaAs; As\*Ga\*Si; Si sy 3; As\*Ga; As sy 2; sy 2; Ga sy  
2; Al; As; Ga

L7 ANSWER 166 OF 187 INSPEC (C) 2006 IEE on STN  
AN 1991:3928933 INSPEC DN A91095945

TI Novel microscopy using stimulated light scattering by laser-induced  
transient reflecting \*\*\*gratings\*\*\* on metallic surfaces.

AU Harata, A.; Sawada, T. (Dept. of Ind. Chem., Tokyo Univ., Japan)  
SO Applied Physics Letters (29 April 1991) vol.58, no.17, p.1839-41. 15 refs.  
Price: CCCC 0003-6951/91/171839-03\$02.00  
CODEN: APPLAB ISSN: 0003-6951

DT Journal  
TC Experimental  
CY United States  
LA English  
AB A novel microscopic method, based on the technique of laser-induced  
transient reflecting \*\*\*gratings\*\*\* , is proposed to monitor  
\*\*\*ion\*\*\* \*\*\*implantation\*\*\* in \*\*\*silicon\*\*\* by noncontact and  
nondestructive ways. Some unique advantages of this technique, such as  
high sensitivity to ion dose and potential real time imaging capability,  
are demonstrated.

CC A0760P Optical microscopy; A6170T Doping and implantation of impurities  
CT ARGON; DIFFRACTION \*\*\*GRATINGS\*\*\* ; ELEMENTAL SEMICONDUCTORS;  
\*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; LIGHT SCATTERING; OPTICAL MICROSCOPY;

\*\*\*SILICON\*\*\* ; STIMULATED SCATTERING

ST microscopy; semiconductor; nondestructive study; stimulated light scattering; metallic surfaces; \*\*\*laser-induced transient reflecting\*\*\*

\*\*\* gratings\*\*\* ; \*\*\*ion implantation\*\*\* ; ion dose; real time imaging capability; \*\*\*Si:Ar\*\*\*

CHI Si:Ar sur, Ar sur, Si sur, Si:Ar bin, Ar bin, Si bin, Ar el, Si el, Ar dop

ET Ar\*Si; Si:Ar; Ar doping; doped materials; Ar; Si

L7 ANSWER 167 OF 187 INSPEC (C) 2006 IEE on STN

AN 1991:3789489 INSPEC DN B91002017

TI A permeable base transistor on \*\*\*Si\*\*\* (100) with implanted CoSi<sub>2</sub>-gate.

AU Schuppen, A.; Mantl, S.; Vescan, L.; Luth, H. (Inst. fur Schicht- und Ionentechn., Julich, West Germany)

SO ESSDERC 90. 20th European Solid State Device Research Conference  
Editor(s): Eccleston, W.; Rosser, P.J.  
Bristol, UK: Adam Hilger, 1990. p.45-8 of xxix+637 pp. 10 refs.  
Conference: Nottingham, UK, 10-13 Sept 1990  
Sponsor(s): IEE; IEEE; EPS  
ISBN: 0-7503-0065-5

DT Conference Article

TC New Development; Practical; Experimental

CY United Kingdom

LA English

AB A permeable base transistor (PBT) has been fabricated by local implantation of <sup>59</sup>Co into \*\*\*Si\*\*\* (100) with subsequent rapid thermal annealing and epitaxial growth of \*\*\*silicon\*\*\* by LPVPE. Transmission electron microscopy shows abrupt interfaces between the buried CoSi<sub>2</sub> and the adjacent \*\*\*silicon\*\*\*. Rutherford backscattering and channeling experiments with a minimum yield of 5.3% for the Co signal as well as a specific resistance of 13 mu ohmcm of the CoSi<sub>2</sub> layers demonstrate the good quality of the \*\*\*Si\*\*\* /CoSi<sub>2</sub>/ \*\*\*Si\*\*\* heterostructure.  
\*\*\*Si\*\*\* /CoSi<sub>2</sub> Schottky diodes revealed ideality factors of 1.01, while PBTs with 1.5 mu m \*\*\*gratings\*\*\* exhibited a maximum transconductance of 11 mS/mm.

CC B2560J Bipolar transistors; B2550B Semiconductor doping; B2550F Metallisation

CT BIPOLAR TRANSISTORS; COBALT COMPOUNDS; \*\*\*ION\*\*\*. \*\*\*IMPLANTATION\*\*\* ; METALLISATION; SEMICONDUCTOR TECHNOLOGY

ST \*\*\*ion implantation\*\*\* ; silicides; permeable base transistor; implanted CoSi<sub>2</sub>-gate; PBT; rapid thermal annealing; epitaxial growth; LPVPE; abrupt interfaces; Rutherford backscattering; channeling experiments; specific resistance; heterostructure; Schottky diodes; ideality factors; transconductance; 13 muohmcm; 1.5 micron; <sup>59</sup>Co; \*\*\*CoSi<sub>2</sub>-Si\*\*\*

CHI CoSi<sub>2</sub>-Si int, CoSi<sub>2</sub> int, Si<sub>2</sub> int, Co int, Si int, CoSi<sub>2</sub> bin, Si<sub>2</sub> bin, Co bin, Si bin, Si el; Co el

PHP resistivity 1.3E-07 ohmm; size 1.5E-06 m

ET Si; C\*O\*Si; CoSi<sub>2</sub>; C cp; cp; O cp; Si cp; Co; <sup>59</sup>Co; is; Co is; Co\*Si; Co sy 2; sy 2; Si sy 2; CoSi<sub>2</sub>; Co cp; CoSi<sub>2</sub>-Si; CoSi

L7 ANSWER 168 OF 187 INSPEC (C) 2006 IEE on STN

AN 1990:3747501 INSPEC DN A90147770

TI Formation of surface inversion layer in F<sup>+</sup>-implanted n-type \*\*\*silicon\*\*\*.

AU Chu, C.H.; Chen, L.J. (Dept. of Mater. Sci. & Eng., National Tsing Hua Univ., Hsinchu, Taiwan); Hwang, H.L.

SO Journal of Crystal Growth (June 1990) vol.103, no.1-4, p.188-96. 24 refs.  
Price: CCCC 0022-0248/90/\$03.50  
CODEN: JCRGAE ISSN: 0022-0248  
Conference: 3rd International Symposium on Defect Recognition and Image Processing in III-V Compounds (DRIP-III). Tokyo, Japan, 22-25 Sept 1989

DT Conference Article; Journal

TC Experimental

CY Netherlands

LA English

AB Influences of fluorine \*\*\*ion\*\*\* \*\*\*implantation\*\*\* on the electrical properties of n-type \*\*\*silicon\*\*\* have been investigated by electron beam induced current (EBIC), Hall and metal-oxide-semiconductor (MOS) high frequency capacitance-voltage (HFCV) measurements. A \*\*\*grating\*\*\* mask was used to delineate the implantation region so that the F<sup>+</sup>-implanted and unirradiated areas were

located in the same Al/n-type \*\*\*Si\*\*\* Schottky diode region. EBIC images, obtained with different electron beam energies, normal and parallel to the diode surface, and EBIC collection efficiencies in the implanted and unirradiated areas were recorded. Fitting data of energy dependent EBIC collection efficiency into the theoretical EBIC model of Schottky diode, the thickness of the metal layer, depletion layer width, minority carrier diffusion length in the substrate and EBIC collection efficiency in the depletion region were determined. The minority carrier recombination in the fluorine implanted area was found to be higher than that of the blank \*\*\*Si\*\*\* area under Schottky contact. Outside the Schottky contact, an inversion layer was observed to form at the surface of the implanted area. The structural perfection of the F+ implanted area was investigated by cross-sectional transmission electron microscopy (XTEM). The p-type characterization in the surface layer of the F+ implanted area was also confirmed by the Hall and HFCV measurements.

CC A7320H Impurity and defect levels; energy levels of adsorbed species; A6170T Doping and implantation of impurities; A7220M Galvanomagnetic and other magnetotransport effects; A7220H High-field and nonlinear effects

CT EBIC; ELEMENTAL SEMICONDUCTORS; FLUORINE; HALL EFFECT; INVERSION LAYERS; \*\*\*ION\*\*\* ; \*\*\*IMPLANTATION\*\*\* ; \*\*\*SILICON\*\*\* ; SURFACE ELECTRON STATES

ST semiconductor; Hall effect; surface inversion layer; \*\*\*ion\*\*\*

\*\*\* implantation\*\*\* ; electrical properties; electron beam induced current; high frequency capacitance-voltage; energy dependent EBIC collection efficiency; Schottky diode; thickness; metal layer; depletion layer width; minority carrier diffusion length; minority carrier recombination; cross-sectional transmission electron microscopy; \*\*\*Si:F\*\*\*

CHI Si:F bin, Si bin, F bin, Si el, F el, F dop

ET F; F+; F ip 1; ip 1; Al; Si; F\*Si; Si:F; Si:F+; F+ doping; doped materials; F doping

L7 ANSWER 169 OF 187 INSPEC (C) 2006 IEE on STN

AN 1990:3535787 INSPEC DN A90019229; B90008944

TI A novel GRIN-SCH-SQW laser diode monolithically integrated with low-loss passive waveguides.

AU Hirata, T.; Maeda, M.; Hosomatsu, H. (Optical Measur. Technol. Dev. Co. Ltd., Central Res. Lab., Tokyo, Japan)

SO Japanese Journal of Applied Physics, Part 2 (Letters) (1989) vol.28, no.8, p.L1429-32

CODEN: JAPLD8 ISSN: 0021-4922

DT Journal

TC New Development; Experimental

CY Japan

LA English

AB The authors propose a novel fabrication process for monolithic multielement laser diodes and demonstrate the performance of a monolithically integrated passive waveguide laser as compared with a conventional laser fabricated under the same procedures. This process, which is based on \*\*\*silicon\*\*\* \*\*\*ion\*\*\* \*\*\*implantation\*\*\* and two-step MOVPE growth, is suitable for integrating optical elements like \*\*\*gratings\*\*\* and rib waveguides. They also demonstrate that the COD level of the window structure laser fabricated by this process is more than 1.3W in pulsed operation.

CC A4260B Design of specific laser systems; A4255P Lasing action in semiconductors with junctions; A4282 Integrated optics; A4280L Optical waveguides and couplers; A4285D Surface grinding, fabrication; A4280R Gradient-index (GRIN) devices; B4320J Semiconductor junction lasers; B4140 Integrated optics; B4130 Optical waveguides

CT GRADIENT INDEX OPTICS; INTEGRATED OPTICS; \*\*\*ION\*\*\*

\*\*\*IMPLANTATION\*\*\* ; OPTICAL WAVEGUIDES; OPTICAL WORKSHOP TECHNIQUES; SEMICONDUCTOR JUNCTION LASERS; VAPOUR PHASE EPITAXIAL GROWTH

ST GRIN-SCH-SQW laser diode; fabrication; monolithic multielement laser diodes; integrated passive waveguide laser; \*\*\*ion implantation\*\*\* ; MOVPE growth; optical elements; \*\*\*gratings\*\*\* ; rib waveguides; COD; window structure laser; pulsed operation; 1.3 W; \*\*\*Si+\*\*\*

CHI Si el

PHP power 1.3E+00 W

ET W; Si; Si+; Si ip 1; ip 1

L7 ANSWER 170 OF 187 INSPEC (C) 2006 IEE on STN

AN 1989:3425310 INSPEC DN A89094308

TI Study of carrier dynamics and radiation defects in \*\*\*ion\*\*\* -

\*\*\*implanted\*\*\*      \*\*\*silicon\*\*\*      by transient      \*\*\*grating\*\*\*  
 techniques.

AU Jonikas, L.; Jarasiunas, K.; Vaitkus, J. (V. Kapsukas State Univ.,  
 Vilnius, Lithuanian SSR, USSR)

SO Physica Status Solidi A (16 March 1989) vol.112, no.1, p.375-80. 11 refs.  
 CODEN: PSSABA ISSN: 0031-8965  
 Conference: International Conference on Ion Implantation in Semiconductors  
 and Other Materials. Lublin, Poland, 12-17 Sept 1988

DT Conference Article; Journal

TC Experimental

CY German Democratic Republic

LA English

AB Investigations of photoelectrical properties of      \*\*\*ion\*\*\* -  
     \*\*\*implanted\*\*\*      \*\*\*Si\*\*\*      are performed by the optical transient  
     \*\*\*grating\*\*\*      technique. A lowering of carrier and thermal diffusion as  
 well as faster recombination are observed. The existence of electrically  
 active radiation defects in a region essentially exceeding the projected  
 mean range of ions is proved by measurements of both light diffraction and  
 photoconductivity.

CC A7220J Charge carriers: generation, recombination, lifetime, and trapping;  
 A7280C Elemental semiconductors; A6180J Ions; A7240 Photoconduction and  
 photovoltaic effects; photodielectric effects; A6170T Doping and  
 implantation of impurities

CT CRYSTAL DEFECTS; ELECTRON-HOLE RECOMBINATION; ELEMENTAL SEMICONDUCTORS;  
     \*\*\*ION\*\*\*      \*\*\*IMPLANTATION\*\*\*      ; LIGHT DIFFRACTION; PHOTOCONDUCTIVITY;  
     \*\*\*SILICON\*\*\*

ST semiconductor; carrier diffusion; carrier dynamics; radiation defects;  
     \*\*\*transient grating techniques\*\*\*      ; photoelectrical properties;  
     \*\*\*ion-implanted Si\*\*\*      ;      \*\*\*optical transient grating technique\*\*\*      ;  
 thermal diffusion; recombination; electrically active radiation defects;  
 light diffraction; photoconductivity;      \*\*\*Si\*\*\*

CHI Si el

ET Si

L7 ANSWER 171 OF 187 INSPEC (C) 2006 IEE on STN

AN 1989:3379467 INSPEC      DN A89065097

TI Picosecond relaxation of surface dynamic      \*\*\*gratings\*\*\*      in implanted  
 and pulse-annealed      \*\*\*silicon\*\*\*      crystals.

AU Baltrameynas, R.; Gashka, R.; Kuokshtis, E.; Nyatikshis, V.; Pyatrauskas,  
 M. (V. Kapsukas Lithuanian State Univ., Vilnius, Lithuanian SSR, USSR)

SO Soviet Physics - Semiconductors (Aug. 1988) vol.22, no.8, p.900-3. 14  
 refs.  
 Price: CCCC 0038-5700/88/080900-04\$03.90  
 CODEN: SPSEAX ISSN: 0038-5700  
 Translation of: Fizika i Tekhnika Poluprovodnikov (Aug. 1988) vol.22,  
 no.8, p.1422-7. 14 refs.  
 CODEN: FTPPA4 ISSN: 0015-3222

DT Journal; Translation Abstracted

TC Experimental

CY USSR; United States

LA English

AB An investigation was made of picosecond diffraction      \*\*\*gratings\*\*\*      in  
     \*\*\*silicon\*\*\*      crystals subjected to      \*\*\*ion\*\*\*      -      \*\*\*implantation\*\*\*  
     \*\*\*doping\*\*\*      and subsequent recrystallization using laser annealing  
 pulses. The decay of the dynamic      \*\*\*gratings\*\*\*      induced on the surface  
 of a semiconductor by interfering beams from a picosecond laser was  
 investigated by a probe method. A theoretical analysis was made of the  
 diffraction efficiency allowing for modulation of the refractive index  
 under the influence of laser radiation and for processes involving  
 recombination of nonequilibrium carriers in the surface region of a  
 crystal. The results of the calculations were compared with the  
 experimental data.

CC A4280F Gratings, echelles; A6170T Doping and implantation of impurities;  
 A8140G Other heat and thermomechanical treatments; A7820D Optical  
 constants and parameters

CT ANNEALING; DIFFRACTION      \*\*\*GRATINGS\*\*\*      ; ELECTRON-HOLE RECOMBINATION;  
 ELEMENTAL SEMICONDUCTORS;      \*\*\*ION\*\*\*      \*\*\*IMPLANTATION\*\*\*      ; REFRACTIVE  
 INDEX;      \*\*\*SILICON\*\*\*

ST carrier recombination;      \*\*\*surface dynamic gratings\*\*\*      ;      \*\*\*picosecond\*\*\*  
     \*\*\*diffraction gratings\*\*\*      ;      \*\*\*ion-implantation\*\*\*      ; laser annealing  
 pulses; semiconductor; refractive index;      \*\*\*Si\*\*\*

CHI Si sur, Si el

ET Si

L7 ANSWER 172 OF 187 INSPEC (C) 2006 IEE on STN  
AN 1989:3369592 INSPEC DN A89060243  
TI Transient \*\*\*gratings\*\*\* in metrology of semiconductor parameters and optoelectronic devices.  
AU Jarasiunas, K.; Vaitkus, J. (Dept. of Phys., Vilnius State Univ., USSR).  
SO Physica Status Solidi B (1 Dec. 1988) vol.150, no.2, p.879-84. 26 refs.  
CODEN: PSSBBD ISSN: 0370-1972  
Conference: International Conference on Optical Nonlinearities and Bistability of Semiconductors. Berlin, East Germany, 22-26 Aug 1988  
DT Conference Article; Journal  
TC Experimental  
CY German Democratic Republic  
LA English  
AB The origin of optical nonlinearity and its magnitude is investigated in different semiconductors and structures, as CdSe, GaAs, InSb, \*\*\*Si\*\*\* (pure, \*\*\*ion\*\*\* - \*\*\*implanted\*\*\*, heavily \*\*\*doped\*\*\* or amorphous), MQWS. The usefulness of the transient \*\*\*grating\*\*\* technique is shown to study peculiarities of the nonequilibrium processes in strong electric fields, at high excitation levels or to reveal the presence and transformation of defects. Some novel possibilities for the deflection of a laser beam and its modulation are demonstrated.  
CC A4280F Gratings, echelles; A4280K Optical beam modulators; A7820J Electro-optical effects; A4265 Nonlinear optics  
CT CRYSTAL DEFECTS; DIFFRACTION \*\*\*GRATINGS\*\*\*; ELECTRO-OPTICAL EFFECTS; NONLINEAR OPTICS; OPTICAL MODULATION; SEMICONDUCTOR QUANTUM WELLS; SEMICONDUCTORS  
ST defect transformation; laser beam modulation; multiple quantum wells; laser beam deflection; metrology; semiconductor parameters; optoelectronic devices; optical nonlinearity; MQWS; \*\*\*transient grating technique\*\*\*; nonequilibrium processes; strong electric fields; high excitation levels; CdSe; GaAs; InSb; \*\*\*Si\*\*\*  
CHI Si el; CdSe bin, Cd bin, Se bin; GaAs bin, As bin, Ga bin; InSb bin, In bin, Sb bin  
ET Cd\*Se; Cd sy 2; sy 2; Se sy 2; CdSe; Cd cp; cp; Se cp; As\*Ga; As sy 2; Ga sy 2; GaAs; Ga cp; As cp; In\*Sb; In sy 2; Sb sy 2; InSb; In cp; Sb cp; Si; Cd; Se; As; Ga; In; Sb

L7 ANSWER 173 OF 187 INSPEC (C) 2006 IEE on STN  
AN 1989:3369574 INSPEC DN A89062008  
TI Reflectivity and dynamic \*\*\*gratings\*\*\* in implanted \*\*\*Si\*\*\* induced by picosecond laser pulses.  
AU Galeckas, A.; Netiksis, V.; Petrauskas, M.; Vaitkus, J. (Vilnius State Univ., USSR)  
SO Physica Status Solidi B (1 Dec. 1988) vol.150, no.2, p.743-8. 13 refs.  
CODEN: PSSBBD ISSN: 0370-1972  
Conference: International Conference on Optical Nonlinearities and Bistability of Semiconductors. Berlin, East Germany, 22-26 Aug 1988  
DT Conference Article; Journal  
TC Experimental  
CY German Democratic Republic  
LA English  
AB The relaxation processes are investigated in high-excited \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*silicon\*\*\* using transient-reflectivity and dynamic \*\*\*grating\*\*\* methods in the picosecond time domain. The dependences of the optical parameters of \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* \*\*\*Si\*\*\* versus \*\*\*implantation\*\*\* does are presented. The temporal behaviour of the non-equilibrium charge carriers obtained from the induced-reflectivity change and \*\*\*grating\*\*\* decay measurements is analysed. The reflectivity decay process is found to be always faster than the corresponding \*\*\*grating\*\*\* decay process. By the numerical calculations the surface recombination velocity is estimated to  $S=4 \times 10^4$  cm/s. The influence of the implantation process on the effective carrier lifetime is discussed.  
CC A7847 Time-resolved optical spectroscopies and other ultrafast optical measurements in condensed matter; A7220J Charge carriers: generation, recombination, lifetime, and trapping; A7280C Elemental semiconductors; A6170T Doping and implantation of impurities; A7820W Other optical properties of bulk materials  
CT BORON; CARRIER LIFETIME; ELEMENTAL SEMICONDUCTORS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\*; PHOSPHORUS; REFLECTIVITY; \*\*\*SILICON\*\*\*; TIME

RESOLVED SPECTRA

ST semiconductor; \*\*\*ion implantation\*\*\* ; nonequilibrium charge carriers; picosecond laser pulses; transient-reflectivity; \*\*\*dynamic grating\*\*\* ; carrier lifetime; \*\*\*Si:B\*\*\* ; \*\*\*Si:P\*\*\*

CHI Si:B bin, Si bin, B bin, Si el, B el, B dop; Si:P bin, Si bin, P bin, Si el, P el, P dop

ET Si; B\*Si; Si:B; B doping; doped materials; P\*Si; Si:P; P doping; P

L7 ANSWER 174 OF 187 INSPEC (C) 2006 IEE on STN

AN 1988:3235669 INSPEC DN A88128391; B88065354

TI Fabrication of index-guided AlGaAs multiquantum well lasers and \*\*\*grating\*\*\* structures by \*\*\*Si\*\*\* -induced disordering.

AU Nakashima, H. (Inst. of Sci. & Ind. Res., Osaka Univ., Japan); Ishida, K.

SO Optoelectronics - Devices and Technologies (Dec. 1987) vol.2, no.2, p.235-45. 24 refs.  
CODEN: ODTEEG ISSN: 0912-5434

DT Journal

TC Experimental

CY Japan

LA English

AB The authors review the application of compositional disordering of MQW to the fabrication of transverse mode controlled AlGaAs MQW lasers and submicron \*\*\*grating\*\*\* structures using conventional and focused \*\*\*ion\*\*\* beam \*\*\*implantation\*\*\* technique. This simple, controllable and reliable technique is expected to be very useful for making optoelectronic integrated circuits.

CC A4255P Lasing action in semiconductors with junctions; A4280F Gratings, echelles; A4282 Integrated optics; A6170T Doping and implantation of impurities; B2530B Semiconductor junctions; B2550B Semiconductor doping; B4140 Integrated optics; B4320J Semiconductor junction lasers

CT ALUMINIUM COMPOUNDS; DIFFRACTION \*\*\*GRATINGS\*\*\* ; GALLIUM ARSENIDE; III-V SEMICONDUCTORS; INTEGRATED OPTICS; \*\*\*ION\*\*\*  
\*\*\*IMPLANTATION\*\*\* ; OPTICAL WORKSHOP TECHNIQUES; SEMICONDUCTOR JUNCTION LASERS; SEMICONDUCTOR SUPERLATTICES

ST multiquantum well lasers; \*\*\*grating structures\*\*\* ; compositional disordering; \*\*\*submicron grating structures\*\*\* ; \*\*\*focused ion beam\*\*\*  
\*\*\*implantation technique\*\*\* ; optoelectronic integrated circuits; AlGaAs

CHI AlGaAs int, Al int, As int, Ga int, AlGaAs ss, Al ss, As ss, Ga ss

ET Al\*As\*Ga; Al sy 3; sy 3; As sy 3; Ga sy 3; AlGaAs; Al cp; cp; Ga cp; As cp; Si; V; Al; As; Ga

L7 ANSWER 175 OF 187 INSPEC (C) 2006 IEE on STN

AN 1988:3229356 INSPEC DN A88128154; B88065666

TI GaAs/GaAlAs distributed Bragg reflector laser with a focused \*\*\*ion\*\*\* beam, low dose \*\*\*dopant\*\*\* \*\*\*implanted\*\*\* \*\*\*grating\*\*\* .

AU Wu, M.C.; Boenke, M.M.; Wang, S. (Dept. of Electr. Eng. & Comput. Sci., California Univ., Berkeley, CA, USA); Clark, W.M., Jr.; Stevens, E.H.; Utlaut, M.W.

SO Applied Physics Letters (25 July 1988) vol.53, no.4, p.265-7. 17 refs.  
Price: CCCC 0003-6951/88/300265-03\$01.00  
CODEN: APPLAB ISSN: 0003-6951

DT Journal

TC Experimental

CY United States

LA English

AB The authors report, for the first time, the performance of a GaAs/GaAlAs distributed Bragg reflector (DBR) laser using a focused \*\*\*ion\*\*\* beam \*\*\*implanted\*\*\* \*\*\*grating\*\*\* (FIB-DBR). Stripes of \*\*\*Si\*\*\* ++ with a period of 2300 AA and a dose approximately 10<sup>14</sup> cm<sup>-2</sup> are directly implanted into the passive large optical cavity layer to provide the distributed feedback. Surface-emitting light from the second-order \*\*\*grating\*\*\* is observed. Threshold current of 110 mA and single DBR mode operation from 20 to 40 degrees C are obtained. The wavelength tuning rate with temperature is 0.8 AA/ degrees C. The coupling coefficient is estimated to be 15 cm<sup>-1</sup>. The results show that FIB technology is practical for distributed feedback and DBR lasers and optoelectronic integrated circuits.

CC A4255P Lasing action in semiconductors with junctions; B4320J Semiconductor junction lasers

CT ALUMINIUM COMPOUNDS; DISTRIBUTED FEEDBACK LASERS; GALLIUM ARSENIDE; III-V SEMICONDUCTORS; LASER TUNING; SEMICONDUCTOR JUNCTION LASERS

ST semiconductor; threshold current; GaAs/GaAlAs distributed Bragg reflector

laser; focused ion beam; \*\*\*low dose dopant implanted grating\*\*\* ;  
 \*\*\*Si++\*\*\* ; passive large optical cavity layer; distributed feedback;  
 \*\*\*second-order grating\*\*\* ; single DBR mode operation; wavelength tuning  
 rate; coupling coefficient; 110 mA; 20 to 40 degC; GaAs-GaAlAs  
 CHI GaAs-GaAlAs int, GaAlAs int, GaAs int, Al int, As int, Ga int, GaAlAs ss,  
 Al ss, As ss, Ga ss, GaAs bin, As bin, Ga bin  
 PHP current 1.1E-01 A; temperature 2.93E+02 to 3.13E+02 K  
 ET As\*Ga; As sy 2; sy 2; Ga sy 2; GaAs; Ga cp; cp; As cp; Al\*As\*Ga; Al sy 3;  
 sy 3; As sy 3; Ga sy 3; GaAlAs; Al cp; Si; Si++; Si ip 1; ip 1; C; V;  
 GaAs-GaAlAs; Al; As; Ga

L7 ANSWER 176 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1988:3039545 INSPEC DN A88007477  
 TI Time-resolved and post-irradiation studies of the interaction of  
 high-power pulsed microwave radiation with \*\*\*silicon\*\*\*  
 AU James, R.B. (Sandia Nat. Lab., Livermore, CA, USA); Bolton, P.R.; Alvarez,  
 R.A.; Valiga, R.E.; Christie, W.H.  
 SO Beam-Solid Interactions and Transient Processes Symposium  
 Editor(s): Thompson, M.O.; Picraux, S.T.; Williams, J.S.  
 Pittsburgh, PA, USA: Mater. Res. Soc, 1987. p.153-8 of xxi+750 pp. 3 refs.  
 Conference: Boston, MA, USA, 1-4 Dec 1986  
 ISBN: 0-931837-40-5  
 DT Conference Article  
 TC Experimental  
 CY United States  
 LA English  
 AB The authors have measured the microwave-induced damage to the near-surface  
 region of \*\*\*silicon\*\*\* for 1.9-  $\mu$ s pulses at a frequency of 2.856  
 GHz and a pulse power of up to 7.2 MW. Rectangular samples were irradiated  
 in a test section of WR-284 waveguide that was filled with freon to a  
 pressure of 30 psig. Incident, transmitted and reflected powers were  
 monitored with directional \*\*\*couplers\*\*\* and fast diodes. The results  
 of the time-resolved optical measurements show that the onset of surface  
 damage is accompanied by a large increase in the reflected power.  
 Examination of the irradiated surfaces shows that the degree of damage is  
 greatest near the edges of the samples. Using secondary \*\*\*ion\*\*\* mass  
 spectrometry to profile the \*\*\*implanted\*\*\* As, they find that the  
 microwave pulses can melt the near-surface region of the material for  
 pulse powers exceeding a threshold value.

CC A6180 Radiation damage and other irradiation effects; A6180 Radiation  
 damage and other irradiation effects; A7870G Microwave and radiofrequency  
 interactions; A7920N Atom, molecule, and ion impact  
 CT ARSENIC; ELEMENTAL SEMICONDUCTORS; RADIATION EFFECTS; REFLECTIVITY;  
 SECONDARY ION MASS SPECTRA; \*\*\*SILICON\*\*\*  
 ST semiconductor; post-irradiation studies; high-power pulsed microwave  
 radiation; microwave-induced damage; near-surface region; WR-284  
 waveguide; freon; transmitted; reflected powers; \*\*\*directional\*\*\*  
 \*\*\* couplers\*\*\* ; fast diodes; time-resolved optical measurements; irradiated  
 surfaces; secondary ion mass spectrometry; implanted As; melt;  
 \*\*\*Si:As\*\*\*

CHI Si:As bin, As bin, Si bin, As el, Si el, As dop  
 ET As; As\*Si; As sy 2; sy 2; Si sy 2; Si:As; As doping; doped materials; Si

L7 ANSWER 177 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1987:3019769 INSPEC DN B87077387  
 TI Microwave scanning microscopy for planar structure diagnostics.  
 AU Gutmann, R.J.; Borrego, J.M.; Chakrabarti, P.; Wang, M.-S. (Dept. of  
 Electr., Comput. & Syst. Eng., Rensselaer Polytech. Inst., Troy, NY, USA)  
 SO 1987 IEEE MTT-S International Microwave Symposium Digest (Cat.  
 No.87CH2395-2)  
 New York, NY, USA: IEEE, 1987. p.281-4 vol.1 of 2 vol. v+1045 pp. 5 refs.  
 Conference: Las Vegas, NV, USA, 9-11 June 1987  
 Sponsor(s): IEEE  
 Price: CCCC 0149-645X/87/0000-0281\$01.00  
 DT Conference Article  
 TC Experimental  
 CY United States  
 LA English  
 AB The authors have utilized three different critically-coupled one-port  
 cavities, with thin-diameter conducting coupling elements providing  
 enhanced lateral sensitivity in microstrip and rectangular waveguide  
 cavities and a circular aperture coupling element in a cylindrical

waveguide cavity providing enhanced depth-resolution capability. Lateral resolutions on the order of a few mils (0.002 wavelengths) and depth resolutions of a few micrometers (0.0001 wavelengths) have been achieved with conventional, low-power X-band instrumentation. Lateral resolution measurements of evaporated aluminum/ \*\*\*silicon\*\*\* \*\*\*gratings\*\*\* with sheet-conductance contrast of 300, \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* n+/n \*\*\*silicon\*\*\* conductivity \*\*\*gratings\*\*\* with sheet-conductance contrast of 2 and dielectrically-isolated, single-crystal-tub \*\*\*silicon\*\*\* wafers are described. More limited depth profile measurements are presented to illustrate depth-resolution capability.

CC B0170E Production facilities and engineering; B1320 Waveguide components; B7310N Microwave techniques

CT CAVITY RESONATORS; INTEGRATED CIRCUIT TESTING; MICROSCOPY; MICROWAVE MEASUREMENT

ST single crystal tub wafers; semiconductor wafers; lateral conductivity variations; microwave scanning microscopy; planar structure diagnostics; critically-coupled; one-port cavities; enhanced lateral sensitivity; microstrip; rectangular waveguide cavities; circular aperture coupling element; cylindrical waveguide cavity; enhanced depth-resolution capability; low-power X-band instrumentation; depth profile measurements; \*\*\*Al-Si gratings\*\*\*

CHI Al-Si int, Al int, Si int, Al el, Si el

ET Al\*Si; Al sy 2; sy 2; Si sy 2; Al-Si; Al; Si

L7 ANSWER 178 OF 187 INSPEC (C) 2006 IEE on STN

AN 1987:2947276 INSPEC DN A87098718; B87053246

TI Fabrication of submicron \*\*\*grating\*\*\* patterns using compositional disordering of AlGaAs-GaAs superlattices by focused \*\*\*Si\*\*\* \*\*\*ion\*\*\* beam \*\*\*implantation\*\*\*

AU Ishida, K.; Miyauchi, E.; Morita, T.; Takamori, T.; Fukunaga, T.; Hashimoto, H.; Nakashima, H. (Optoelectron. Joint Res. Lab., Kawasaki, Japan)

SO Japanese Journal of Applied Physics, Part 2 (Letters) (April 1987) vol.26, no.4, p.L285-7  
CODEN: JAPLD8 ISSN: 0021-4922

DT Journal

TC Experimental

CY Japan

LA English

AB Submicron \*\*\*grating\*\*\* patterns (0.4  $\mu$ m period) were fabricated in AlGaAs-GaAs superlattices (SLs) using compositional disordering of SLs by focused \*\*\*Si\*\*\* \*\*\*ion\*\*\* beam \*\*\*implantation\*\*\* and subsequent annealing. The \*\*\*grating\*\*\* structure which is composed of preserved SL and mixed (disordered) regions was confirmed by scanning electron microscopic (SEM) and scanning Auger microscopic (SAM) observations.

CC A6170T Doping and implantation of impurities; A6848 Solid-solid interfaces; B2520D II-VI and III-V semiconductors; B2530B Semiconductor junctions; B2550B Semiconductor doping

CT ALUMINIUM COMPOUNDS; AUGER EFFECT; GALLIUM ARSENIDE; III-V SEMICONDUCTORS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; SCANNING ELECTRON MICROSCOPE EXAMINATION OF MATERIALS; SEMICONDUCTOR SUPERLATTICES; \*\*\*SILICON\*\*\*

ST semiconductor; fabrication; \*\*\*submicron grating\*\*\* ; compositional disordering; \*\*\*focused Si ion beam implantation\*\*\* ; annealing; scanning electron microscopic; scanning Auger microscopic; 0.4 micron; AlGaAs-GaAs superlattices; \*\*\*AlGaAs:Si\*\*\*

CHI AlGaAs:Si int, AlGaAs int, Al int, As int, Ga int, Si int, AlGaAs:Si ss, AlGaAs ss, Al ss, As ss, Ga ss, Si ss, Si el, Si dop; AlGaAs-GaAs int, AlGaAs int, GaAs int, Al int, As int, Ga int, AlGaAs ss, Al ss, As ss, Ga ss, GaAs bin, As bin, Ga bin

PHP size 4.0E-07 m

ET Al\*As\*Ga; Al sy 3; sy 3; As sy 3; Ga sy 3; AlGaAs; Al cp; cp; Ga cp; As cp; GaAs; AlGaAs-GaAs; Si; V; Al\*As\*Ga\*Si; Al sy 4; sy 4; As sy 4; Ga sy 4; Si sy 4; AlGaAs:Si; Si doping; doped materials; Al; As; Ga; As\*Ga; As sy 2; sy 2; Ga sy 2

L7 ANSWER 179 OF 187 INSPEC (C) 2006 IEE on STN

AN 1987:2842417 INSPEC DN A87038385

TI Crystalline films on amorphous substrates by zone melting and surface-energy-driven grain growth in conjunction with patterning.

AU Smith, H.I. (Dept. of Electr. Eng. & Comput. Sci., MIT, Cambridge, MA,



USA); Geis, M.W.; Thompson, C.V.; Chen, C.K.  
SO Semiconductor-on-Insulator and Thin Film Transistor Technology Symposium  
Editor(s): Chiang, A.; Geis, M.W.; Pfeiffer, L.  
Pittsburgh, PA, USA: Mater. Res. Soc, 1986. p.3-13 of xvii+474 pp. 30  
refs.  
Conference: Boston, MA, USA, 3-6 Dec 1985  
Sponsor(s): Mater. Res. Soc  
ISBN: 0-931837-18-9  
DT Conference Article  
TC General Review; Experimental  
CY United States  
LA English  
AB Two approaches to preparing oriented crystalline films on amorphous  
substrates are reviewed briefly: zone-melting recrystallization (ZMR) and  
surface-energy-driven grain growth (SEDGG). In both approaches patterning  
can be employed either to establish orientation or to control the location  
of defects. ZMR has been highly successful for the growth of \*\*\*Si\*\*\*  
films on oxidized \*\*\*Si\*\*\* substrates, but its applicability is  
limited by the high temperatures required. SEDGG has been investigated as  
a potentially universal, low temperature approach. It has been  
demonstrated in \*\*\*Si\*\*\*, Ge, and Au. Surface \*\*\*gratings\*\*\* favor  
the growth of grains with a specific in-plane orientation. In order for  
SEDGG to be of broad practical value, the mobility of semiconductor grain  
boundaries must be increased substantially. Mobility enhancement has been  
achieved via \*\*\*doping\*\*\* and \*\*\*ion\*\*\* \*\*\*bombardment\*\*\*.  
CC A0130R Reviews and tutorial papers; resource letters; A6170N Grain and  
twin boundaries; A6855 Thin film growth, structure, and epitaxy; A8115  
Methods of thin film deposition  
CT ELEMENTAL SEMICONDUCTORS; GERMANIUM; GOLD; GRAIN BOUNDARY DIFFUSION; GRAIN  
GROWTH; METALLIC THIN FILMS; RECRYSTALLISATION; REVIEWS; SEMICONDUCTOR  
GROWTH; SEMICONDUCTOR THIN FILMS; \*\*\*SILICON\*\*\*; ZONE MELTING  
ST \*\*\*oxidised Si substrates\*\*\*; semiconductors; grain boundary mobility  
enhancement; \*\*\*surface gratings\*\*\*; amorphous substrates;  
zone-melting recrystallization; surface-energy-driven grain growth;  
doping; \*\*\*ion bombardment\*\*\*; \*\*\*Si films\*\*\*; Ge; Au; SiO  
CHI SiO sur, Si sur, O sur, SiO bin, Si bin, O bin; Si el; Ge el; Au el  
ET Si; Ge; Au; O\*Si; SiO; Si cp; cp; O cp; O  
L7 ANSWER 180 OF 187 INSPEC (C) 2006 IEE on STN  
AN 1987:2793648 INSPEC DN A87011034  
TI The diffraction of light by transient \*\*\*gratings\*\*\* in crystalline,  
\*\*\*ion\*\*\* - \*\*\*implanted\*\*\*, and amorphous \*\*\*silicon\*\*\*.  
AU Vaitkus, J.; Harasiunas, K.; Gaubas, E.; Jonikas, L.; Pranaitis, R. (Dept.  
of Semicond. Phys., Vilnius V. Kapsukas State Univ., Lithuanian SSR,  
USSR); Subacius, L.  
SO IEEE Journal of Quantum Electronics (Aug. 1986) vol.QE-22, no.8,  
p.1298-305. 28 refs.  
Price: CCCC 0018-9197/86/0800-1298\$01.00  
CODEN: IEJQA7 ISSN: 0018-9197  
DT Journal  
TC Theoretical; Experimental  
CY United States  
LA English  
AB The results of applying the transient \*\*\*grating\*\*\* technique to  
single crystals of \*\*\*silicon\*\*\* are analyzed, taking into account  
free-carrier absorption and nonlinear recombination. Using different  
configurations of this technique, the exposure and decay characteristics  
of \*\*\*gratings\*\*\* in the volume or surface of \*\*\*silicon\*\*\* of  
different properties (pure, \*\*\*doped\*\*\* with deep or shallow traps,  
\*\*\*ion\*\*\* \*\*\*implanted\*\*\*, or amorphous) are investigated. The  
presence of impurities does not change the dominant mechanism of  
refractive index modulation by the photogenerated nonequilibrium carriers.  
Increase damage of \*\*\*Si\*\*\* leads to a decrease in carrier diffusion  
(implanted \*\*\*Si\*\*\* ) with, in the case of amorphous \*\*\*Si\*\*\*,  
domination of \*\*\*grating\*\*\* decay by carrier recombination. The  
properties of \*\*\*gratings\*\*\* in high external DC or AC (microwave)  
electric fields allows the evaluation of hot-carrier diffusion  
coefficients.  
CC A4265 Nonlinear optics; A4280F Gratings, echelles; A7220J Charge carriers:  
generation, recombination, lifetime, and trapping  
CT AMORPHOUS SEMICONDUCTORS; DIFFRACTION \*\*\*GRATINGS\*\*\*; ELEMENTAL  
SEMICONDUCTORS; LIGHT DIFFRACTION; NONLINEAR OPTICS; \*\*\*SILICON\*\*\*

ST \*\*\*crystalline Si\*\*\* ; microwave electric fields; \*\*\*ion-implanted\*\*\*  
 \*\*\* Si\*\*\* ; semiconductor; deep traps; \*\*\*transient grating\*\*\* ; single  
 crystals; free-carrier absorption; nonlinear recombination; decay  
 characteristics; shallow traps; refractive index modulation;  
 photogenerated nonequilibrium carriers; \*\*\*implanted Si\*\*\* ;  
 \*\*\*amorphous Si\*\*\* ; hot-carrier diffusion coefficients

ET Si

L7 ANSWER 181 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1982:1897922 INSPEC DN B82041141  
 TI \*\*\*Silicon\*\*\* as a millimeter-wave monolithically integrated  
 substrate-a new look.  
 AU Rosen, A.; Caulton, M.; Stabile, P.; Gombar, A.M.; Janton, W.M.; Chung,  
 P.Wu; Corboy, J.F.; Magee, C.W. (RCA Labs., Princeton, NJ, USA)  
 SO RCA Review (Dec. 1981) vol.42, no.4, p.633-60. 116 refs.  
 CODEN: RCARCI ISSN: 0033-6831  
 DT Journal  
 TC Bibliography; Experimental  
 CY United States  
 LA English  
 AB Materials suitable for use as monolithic substrates are summarized. A  
 study of the properties of \*\*\*silicon\*\*\* substrates as transmission  
 line media shows that serious consideration should be given to them for  
 use at mm-wave frequencies. It is concluded that for \*\*\*silicon\*\*\*  
 resistivities of 2000 ohm-cm or greater, microstrip loss in  
 \*\*\*silicon\*\*\* at mm-wave frequencies is only slightly higher than that  
 in GaAs or alumina. The substrate thickness (using the latest dispersion  
 characteristics) is especially considered in circuit design. These effects  
 on the design of 3-dB interdigitated and branch-line \*\*\*couplers\*\*\*  
 are demonstrated. Fabrication of \*\*\*silicon\*\*\* IMPATT diodes operating  
 up to 200 GHz has been accomplished by novel techniques that maintain the  
 \*\*\*silicon\*\*\* 's high resistivity. The authors report on diodes yielding  
 25 mW CW at 102 GHz, 16 mW CW at 132 GHz, and 1 mW at 195 GHz. The  
 techniques described are \*\*\*ion\*\*\* \*\*\*implantation\*\*\* , laser  
 annealing, unique secondary- \*\*\*ion\*\*\* mass spectrometry (SIMS),  
 profile diagnostics, and novel wafer thinning. The utilization of these  
 technologies paves the way for the processing of \*\*\*silicon\*\*\*  
 monolithic mm-wave integrated circuits.

CC B1310 Waveguides; B1350F Solid-state circuits and devices; B2520C  
 Elemental semiconductors; B2550 Semiconductor device technology; B2550G  
 Lithography; B2560H Junction and barrier diodes; B2570 Semiconductor  
 integrated circuits

CT ELEMENTAL SEMICONDUCTORS; IMPATT DIODES; INTEGRATED CIRCUIT TECHNOLOGY;  
 \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; LASER BEAM ANNEALING; MICROWAVE  
 INTEGRATED CIRCUITS; MONOLITHIC INTEGRATED CIRCUITS; \*\*\*SILICON\*\*\* ;  
 STRIP LINES; SUBSTRATES

ST \*\*\*Si monolithic ICs\*\*\* ; EHF; \*\*\*3 dB interdigitated couplers\*\*\* ;  
 frequencies 100 to 200 GHz; transmission line media; microstrip loss;  
 substrate thickness; dispersion characteristics; \*\*\*branch-line\*\*\*  
 \*\*\* couplers\*\*\* ; IMPATT diodes; \*\*\*ion implantation\*\*\* ; laser annealing;  
 secondary-ion mass spectrometry; SIMS; profile diagnostics; wafer  
 thinning; monolithic mm-wave integrated circuits

ET As\*Ga; As sy 2; sy 2; Ga sy 2; GaAs; Ga cp; cp; As cp; B; Si; Cs\*I; ICs; I  
 Cp; Cs cp

L7 ANSWER 182 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1980:1589335 INSPEC DN A80101102; B80052379  
 TI \*\*\*Ion\*\*\* \*\*\*implanted\*\*\* \*\*\*grating\*\*\* type \*\*\*Si\*\*\*  
 solar cells.  
 AU Hwang, H.; Tang, R.; Loferski, J.J.; Yang, Y.-C. (Dept. of Electrical &  
 Power Engng., Nat. Tsing Hua Univ., Hsinchu, Taiwan)  
 SO Japanese Journal of Applied Physics (1979) vol.19, suppl.19-1, p.527-32.  
 17 refs.  
 CODEN: JJAPA5 ISSN: 0021-4922  
 Conference: Proceedings of the 11th Conference on Solid State Devices.  
 Tokyo, Japan, 1979  
 Sponsor(s): Japan Soc. Appl. Phys  
 DT Conference Article; Journal  
 TC Theoretical; Experimental  
 CY Japan  
 LA English  
 AB \*\*\*Silicon\*\*\* \*\*\*grating\*\*\* -type solar cells have been fabricated

by \*\*\*ion\*\*\* - \*\*\*implantation\*\*\* techniques. The cells as-fabricated showed maximum Voc of 0.54 V, and maximum Isc of 34 mA/cm<sup>2</sup> (without AR coating) under an AM1 illumination, and maximum FF of 0.68. The series resistance problems were examined, and metal gridding superimposed on the \*\*\*grating\*\*\* was found essential. The effects of impurity profiles and the annealing conditions have been studied. For a fixed value of junction depth, the cell output peaked for doping levels around 10<sup>19</sup> cm<sup>-3</sup>. For a fixed \*\*\*grating\*\*\* geometry, it was found within the limits of the \*\*\*implanted\*\*\* \*\*\*ion\*\*\* concentration, the deeper the junction the higher the cell efficiency, which is in contrast to the commonly shallow junction cells. It was also found that slow cooling from thermal annealing is essential in improving the \*\*\*ion\*\*\* - \*\*\*implanted\*\*\* solar cell efficiencies.

CC A6170T Doping and implantation of impurities; A6170W Impurity concentration, distribution, and gradients; A6180J Ions; A8140G Other heat and thermomechanical treatments; A8630J Photoelectric conversion: solar cells and arrays; B2550B Semiconductor doping; B8420 Solar cells and arrays

CT ANNEALING; DOPING PROFILES; ELEMENTAL SEMICONDUCTORS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; SEMICONDUCTOR DOPING; \*\*\*SILICON\*\*\* ; SOLAR CELLS

ST AM1 illumination; series resistance; impurity profiles; annealing conditions; \*\*\*Si grating type solar cells\*\*\* ; \*\*\*ion\*\*\* \*\*\*implantation\*\*\* ; cooling; elemental semiconductors

L7 ANSWER 183 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1980:1587185 INSPEC DN A80093934; B80052426  
 TI \*\*\*Ion\*\*\* \*\*\*implanted\*\*\* \*\*\*grating\*\*\* type \*\*\*Si\*\*\* solar cells: junction depth dependence.

AU Hwang, H.L.; Liu, D.C.; Tang, R.S.; Kao, Y.R.; Loferski, J.J. (Nat. Tsing Hua Univ., Hsinchu, Taiwan)

SO Fourteenth IEEE Photovoltaic Specialists Conference 1980 New York, NY, USA: IEEE, 1980. p.381-5 of 1411 pp. 9 refs. Conference: San Diego, CA, USA, 7-10 Jan 1980 Sponsor(s): IEEE

DT Conference Article  
 TC Theoretical; Experimental  
 CY United States  
 LA English

AB \*\*\*Silicon\*\*\* \*\*\*grating\*\*\* -type solar cells in which the light receiving surface is covered by a finely spaced \*\*\*grating\*\*\* of charge collection barriers were fabricated by \*\*\*ion\*\*\* \*\*\*implantation\*\*\*. The as-fabricated cells exhibited Voc of 0.54 V, Isc(AM1) of 32 mA/cm<sup>2</sup> (without AR coating), a fill factor of 0.68 and a conversion efficiency of 11%. It was found that annealing at 1100 degrees C for a few minutes followed by a slow cooling rate was required to obtain optimized performance. For a fixed \*\*\*grating\*\*\* geometry deep junctions resulted in better cells than shallow junctions within the boron implants. The author describes the results of numerical simulation in which alternating direction implicit methods were employed to obtain the collection efficiencies of \*\*\*grating\*\*\* cells with varying junction depths. The computed AM1 I-V characteristics of \*\*\*grating\*\*\* \*\*\*Si\*\*\* cells are also described.

CC A8630J Photoelectric conversion: solar cells and arrays; B8420 Solar cells and arrays

CT BORON; ELEMENTAL SEMICONDUCTORS; \*\*\*ION\*\*\* \*\*\*IMPLANTATION\*\*\* ; \*\*\*SILICON\*\*\* ; SOLAR CELLS

ST junction depth; charge collection barriers; \*\*\*ion implantation\*\*\* ; fill factor; conversion efficiency; collection efficiencies; \*\*\*Si\*\*\* ; B; \*\*\*grating type solar cells\*\*\* ; alternating direction implicit numerical simulation

ET Si; C; I\*V; I-V; B

L7 ANSWER 184 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1980:1543285 INSPEC DN B80035013  
 TI X-ray lithography by synchrotron radiation of the SOR-RING storage ring.  
 AU Aritome, H.; Matsui, S.; Moriwaki, K.; Namba, S. (Faculty of Engng. Sci., Osaka Univ., Toyonaka, Osaka, Japan)  
 SO Journal of Vacuum Science and Technology (Nov.-Dec. 1979) vol.16, no.6, p.1939-41. 2 refs.  
 CODEN: JVSTAL ISSN: 0022-5355  
 Conference: Proceedings of the 15th Symposium on Electron, Ion, and Photon Beam Technology. Boston, MA, USA, 29 May-1 June 1979

DT Conference Article; Journal  
TC New Development; Practical; Experimental  
CY United States  
LA English  
AB X-ray lithography by synchrotron radiation is a promising technique for a very high resolution replication of submicron patterns. The main disadvantage of X-ray lithography by synchrotron radiation is that the experimental system becomes large and expensive. In this report, the results of X-ray lithography by using the SOR-RING storage ring at an electron energy of 300 MeV is presented. The SOR-RING of the University of Tokyo has a radius of curvature of the electron orbit of 1.1 m and a total orbit length of 17.4 m. The fabrication method of X-ray masks for synchrotron radiation is described. As a pattern supporting material, a parylene film of 1-2  $\mu\text{m}$  thick is used. In this case, the wavelength range between 5-10 nm of synchrotron radiation is effective for exposure of resist. The optimum resolution of pattern replication would be obtained by the wavelength component. Moreover, pattern replication with large contrast is obtained. Line patterns, which are 100-500 nm wide, and \*\*\*grating\*\*\* patterns are replicated in PMMA resist with a large aspect ratio. The above patterns were transferred in various materials such as \*\*\*Si\*\*\* and  $\text{SiO}_2$  by reactive sputter etching. Etching mask patterns are replicated from the pattern of resist itself or fabricated by metal lift-off. Vertical-walled line patterns of 0.5-  $\mu\text{m}$  thick \*\*\*Si\*\*\* are obtained by resist as a mask. \*\*\*Ion\*\*\* - \*\*\*bombardment\*\*\* -enhanced chemical etching is also described as a pattern transfer method of submicron size.

CC B2550G Lithography; B2570 Semiconductor integrated circuits  
CT MASKS; PHOTOLITHOGRAPHY; X-RAY APPLICATIONS  
ST X-ray lithography; synchrotron radiation; high resolution replication; submicron patterns; 300 MeV; X-ray masks; parylene film; PMMA resist; SOR RING storage ring  
ET Si; O\*Si;  $\text{SiO}_2$ ; Si cp; cp; O cp

L7 ANSWER 185 OF 187 INSPEC (C) 2006 IEE on STN  
AN 1980:1527024 INSPEC DN A80058805; B80029713  
TI High quantum efficiency waveguide coupled photodetectors on \*\*\*silicon\*\*\* substrate.

AU Yao, S.K.; August, R.R. (Rockwell Internat. Electronics Res. Center, Anaheim, CA, USA)  
SO Integrated and Guided-wave Optics Technical Digest  
New York, NY, USA: IEEE, 1980. p.ME5/1-4 of 300 pp. 6 refs.  
Conference: Incline Village, NV, USA, 28-30 Jan 1980  
Sponsor(s): IEEE; Opt. Soc. America

DT Conference Article  
TC Experimental  
CY United States  
LA English  
AB Reports integrated optics waveguide coupled photodetectors made on \*\*\*silicon\*\*\* with 50% quantum efficiency. Efficient transition region bridging 7059 glass/ $\text{SiO}_2$ / \*\*\*Si\*\*\* waveguide and the detector are prepared with  $\text{Ar}^+$  implantation treatment. Controlled chemical etch profile is used to give reproducible efficient waveguide/detector coupling.

CC A4280L Optical waveguides and couplers; A4282 Integrated optics; A6170T Doping and implantation of impurities; B2520C Elemental semiconductors; B2550B Semiconductor doping; B4130 Optical waveguides; B4140 Integrated optics; B4250 Photoelectric devices; B4270 Integrated optoelectronics  
CT ELEMENTAL SEMICONDUCTORS; INTEGRATED OPTICS; \*\*\*ION\*\*\*  
\*\*\*IMPLANTATION\*\*\*; OPTICAL \*\*\*COUPLERS\*\*\*; OPTICAL WAVEGUIDES; PHOTODETECTORS; \*\*\*SILICON\*\*\*; SUBSTRATES  
ST waveguide coupled photodetectors; integrated optics; 50% quantum efficiency;  $\text{Ar}^+$  implantation; chemical etch profile; efficient waveguide/detector coupling; \*\*\*7059 glass/ $\text{SiO}_2$ /Si waveguide\*\*\*; efficient transition bridging region; \*\*\*Si substrate\*\*\*  
ET O\*Si;  $\text{SiO}_2$ ; Si cp; cp; O cp;  $\text{Ar}^+$ ;  $\text{Ar}^+$ ;  $\text{Ar}^+$  ip 1; ip 1; Si

L7 ANSWER 186 OF 187 INSPEC (C) 2006 IEE on STN  
AN 1980:1526587 INSPEC DN B80029151  
TI Fabrication of a \*\*\*grating\*\*\* pattern with submicrometer dimension in \*\*\*silicon\*\*\* crystal by \*\*\*ion\*\*\* - \*\*\*bombardment\*\*\* -enhanced etching.

AU Moriwaki, K.; Masuda, N.; Aritome, H.; Namba, S. (Faculty of Engng. Sci., Osaka Univ., Toyonaka, Osaka, Japan)

SO Japanese Journal of Applied Physics (March 1980) vol.19, no.3, p.491-4  
 CODEN: JJAPA5 ISSN: 0021-4922  
 DT Journal  
 TC Practical  
 CY Japan  
 LA English  
 AB \*\*\*Ion\*\*\* - \*\*\*bombardment\*\*\* -enhanced etching (IBEE) as a means for  
 fabrication of submicron pattern is described. Electron beam lithography  
 and lift-off technique are used to form a Cr mask pattern for \*\*\*ion\*\*\*  
 - \*\*\*bombardment\*\*\*. The etched depth can be controlled from 83 to 128  
 nm by varying the ion dose with an accuracy of 10 nm. A \*\*\*grating\*\*\*  
 pattern with a period of 0.6  $\mu$ m is fabricated in a \*\*\*Si\*\*\*  
 substrate by IBEE technique by using Ar<sup>+</sup> ion. At an Ar<sup>+</sup> ion energy of 60  
 keV, the amount of side etching is observed to be 40 nm for a 0.21-  $\mu$ m  
 deep etched sample. This result shows the high resolution of IBEE.  
 CC B2550E Surface treatment and oxide film formation; B2550G Lithography  
 CT ELEMENTAL SEMICONDUCTORS; ETCHING; INTEGRATED CIRCUIT TECHNOLOGY;  
 SEMICONDUCTOR TECHNOLOGY; \*\*\*SILICON\*\*\*; SPUTTER ETCHING  
 ST \*\*\*grating pattern\*\*\*; fabrication; submicron pattern; Cr mask  
 pattern; \*\*\*ion bombardment enhanced etching\*\*\*; electron beam  
 lithography; lift off technique  
 ET Cr; Si; Ar; Ar<sup>+</sup>; Ar ip 1; ip 1

L7 ANSWER 187 OF 187 INSPEC (C) 2006 IEE on STN  
 AN 1976:855943 INSPEC DN A76007590; B76005354  
 TI \*\*\*Ion\*\*\* - \*\*\*doped\*\*\* layer-a new material for recording  
 holograms.  
 AU Shtyrkov, E.I.; Khaibullin, I.B.; Galyautdinov, M.F.; Zaripov, M.M.  
 SO Optics and Spectroscopy (May 1975) vol.38, no.5, p.595-7. 7 refs.  
 CODEN: OPSUA3 ISSN: 0030-400X  
 Translation of: Optika i Spektroskopiya (May 1975) vol.38, no.5, p.1031-4.  
 7 refs.  
 CODEN: OSFMA3 ISSN: 0030-4034  
 DT Journal; Translation Abstracted  
 TC Practical; Experimental  
 CY USSR; United States  
 LA English  
 AB The authors claim that \*\*\*ion\*\*\* - \*\*\*doped\*\*\* amorphous  
 semiconductors may be a suitable medium for recording holograms. They  
 report an examination on \*\*\*silicon\*\*\* doped with P31 for recording in  
 the infra-red with a reconstruction in the visible region. Details are  
 given of the energy to 'record', the spatial frequency of the  
 \*\*\*grating\*\*\* and the potential materials suitable for such recording.  
 CC A0768 Photography, photographic instruments and techniques; A4240H  
 Photographic and recording problems; A4240K Holographic instrumentation  
 and techniques; B4350 Holography  
 CT HOLOGRAPHY; PHOTOGRAPHIC MATERIALS  
 ST amorphous semiconductors; spatial frequency; hologram recording; IR  
 recording; visible reconstruction; \*\*\*ion doping\*\*\*

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FILE 'STNGUIDE' ENTERED AT 08:01:20 ON 26 JAN 2006

FILE 'HOME' ENTERED AT 08:01:24 ON 26 JAN 2006

FILE 'CAPLUS, INSPEC' ENTERED AT 08:01:32 ON 26 JAN 2006

L1 142298 S (GRATING OR COUPLER OR DFG)  
 L2 0 S CRYSTAL? (5A) SILICON  
 L3 72758 S CRYSTAL? (5A) SILICON  
 L4 63412 S AMORPHOUS (5A) SILICON  
 L5 36 S L1 AND L3 AND L4  
 L6 744 S L1 AND (ION(5A) (IMPLANT? OR BOMBARD? OR DOP?))  
 L7 187 S L6 AND (SI OR SILICON OR SOI)

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